

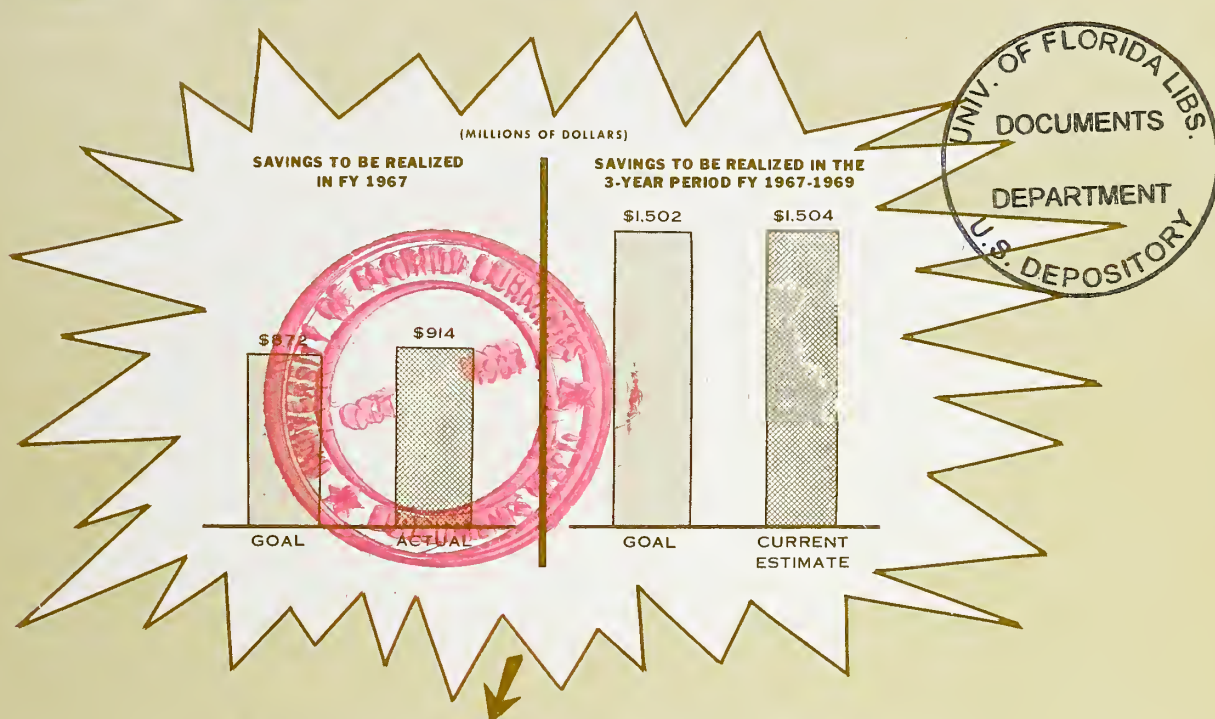
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DEPARTMENT OF DEFENSE

COST REDUCTION



JOURNAL



Memo From One Economizer To Another (p. 57)

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Cost Reduction Journal

Published by the Directorate for Cost Reduction Policy, Office of the Assistant Secretary of Defense (Installations and Logistics).

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BATTLE TANK REACHES NEW HEIGHTS

The tank, treads shrieking and engine revved to peak, scrambled the final barrier and streaked toward the lone shard of light that pierced the blanketing dark. Bien Hoi? Da Nang? Phu Bai?

No! This tank, a toy one, was deployed in the recesses between interior ceiling and exterior roof in a building at the Air Force's Arnold Engineering Development Center, Tullahoma, Tenn.

Objective? Run wire for a fire alarm system over the ceiling from light fixture to light fixture.

When lateral studs and other projections on the ceiling ruled out the conventional method of snaking the wire between light fixture holes, Jim Jones (right in photo) and C. S. Hood of the Center's electrical shop concocted the ploy of using a toy tank to draw the wire. Willie Fuson (left in photo), an electrician at the Center, used two strings to guide the tank as it pulled the wires where needed.

Battle action? No. Logistics? Maybe. Cost reduction? Sure, \$2,200 worth—for wiring two buildings at the Center.



HOLY MACKEREL, BATMAN—MAGNETIC BAIT

Casting about for a better way to remove radioactive cobalt-60 sealed capsules from source wells, the Army hooked onto an idea that saves \$2,100 a year. What is more, the Army will net substantial health, safety, and morale benefits that are not exactly small fry either.

The capsules are used at the Army's radiological training facility, Rideout Field, Fort McClellan, Ala. Rideout Field is the largest live radiation field in the free world and is designed to simulate the radioactive fallout pattern from explosion of a 0.1 kiloton nuclear device. The field contains 1,000 source wells, each holding a cobalt-60 capsule which produces gamma radiation. By use of a master console, the capsules can be raised or lowered in the wells by compressed air to

simulate the various stages of fallout activity—from arrival, through buildup, to final decay.

Everything does not always go swimmingly with this school of hot fish. Several times a day, during various training demonstrations, the capsules become stuck in the wells and have to be dislodged, removed, and replaced. These chores used to take the combined efforts of 12 enlisted men, six vehicles, and a powerpack to raise the capsules to a full-up position where they could be grasped by special handling tongs and removed. Stuck capsules presented the biggest problem because the men had to work so close to the wells that they were in danger of being exposed to a high radiation background dose. When a capsule could not be removed readily from one well, the radiation danger hindered the maintenance work on adjacent wells.

Taking a page from *The Compleat Angler*, SFC Darwin D. Shutt hit upon a new way to tackle the problem. Shutt's theory was to hook the capsule with a plain, old-fashioned magnet suspended from a line attached to a 9-foot fishing rod to assure safe distance.

This method eliminates the need for a bulky powerpack. The capsules can be caught in any position—stuck or unstuck—and reeled to the surface where they can be swung safely into position and dropped into the security container. This technique enables nine enlisted men with five vehicles to remove or dislodge 24 capsules in approximately 6 hours. Exposure to radiation background danger is reduced by 60 percent.

Easy? Just like shooting fish in a barrel.



UNIFORMED IDEA MEN— HOW PROLIFIC?

Some truly amazing things can happen in only 9 months. We refer, of course, to the incentive awards program for military personnel—which was brand, spanking new in September 1965 and a howling success by the end of fiscal year 1966. In that short span, our soldiers, sailors, marines, and airmen popped 141,368 ideas into the suggestion hopper. A total of 25,555 of these were adopted. Of these, 19,480 rang the bell for cash awards totaling \$362,915 (6,075 of the suggestions fell within assigned job responsibilities, thus placing them in the no-cash-award category).

One-fourth of the suggestions that received cash recognition produced measurable benefits of \$33,388,887, or an average \$156 return to the taxpayer for each one of the \$213,537 dollars invested in awards. The average award per beneficial suggestion was \$44.

14,619 cash awards were made for intangible benefits (not measurable in terms of dollar savings). These benefits related to such things as health, morale, safety, welfare and the like. Cash awarded per approved suggestion in this category averaged \$10.21.

While 95 percent of the awards were in the \$50 or below range, a number of major cash awards were made. For example:

- An Army sergeant first class received \$1,000 for suggesting a better maintenance shelter for missiles.

- An Air Force sergeant received \$1,000 for suggesting the modification of excess gyroscopes so as to make substantial new procurement unnecessary.
- A Navy chief warrant officer received \$560 for a suggestion which improved handling, processing and usage of packaged petroleum, oil and lubricant products.

The awards picture varies widely among the military departments, primarily as a result of timing in the initiation of the program. For example, the Air Force used nonappropriated funds to run an active program long before approval of the present program. It is also important to recognize that during a substantial part of the 9-month period, the current program was not in full operation because implementing instructions had to be developed and disseminated. For these reasons, the following table is not a valid basis for departmental comparisons.

However, the table does show the exceptional start that has been made and the outstanding results obtained in a relatively short period of time. It is evident from the record that military personnel, individually as well as collectively, are much more than just “cost conscious.” They are, in fact, “cost concerned” and are doing something about it!

SUGGESTIONS ADOPTED AND CASH AWARDS TO MEMBERS OF THE ARMED FORCES

September 22, 1965–June 30, 1966

Departments/agencies	For tangible (measurable) benefits			For intangible benefits	
	Number of awards	Amount of awards	Value of measurable benefits	Number of awards	Amount of awards
Defense total.....	4, 861	\$213, 537	\$33, 388, 887	14, 619	\$149, 378
Army.....	1, 211	38, 694	2, 514, 265	2, 986	17, 333
Navy.....	109	8, 563	241, 862	232	4, 770
Air Force.....	3, 529	163, 725	30, 563, 760	11, 381	126, 550
OSD and defense agencies.....	12	2, 555	69, 000	20	725



VIETNAM

—Buildup from a Standing Start

By **GENERAL EARLE G. WHEELER**
Chairman, Joint Chiefs of Staff

Murphy's Law Rebutted

There is more truth than tongue-in-cheek in Murphy's Law: "Whatever can go wrong, will go wrong." Over the long years, this has often been true in warfare because of its inherent uncertainties, pressures, and difficulties. And it has been particularly true in this nation, at war's beginning, with its idealistic concentration on peace and its traditional aversion to preparing in advance for war.

But in many respects, the Vietnam War overturns Murphy's Law and presents a marked contrast with our past. This is true of our operations and, especially, of our logistics. Since the decision to deploy major forces for Southeast Asia, most things have gone right because we were better prepared than we have ever been before. We had plans. We had versatile forces in being. These forces were well trained and well equipped. We were able to move large numbers of them in a remarkably short period of time. And the battle performance of our men, from the first day, has been superb.

The "Least-Celebrated Achievement"

As in all conflicts, our operations in Vietnam are founded on all-important logistic base. Part of it was essentially in being here in the United States, but much of it had to be created, quickly and quite literally from scratch, in an underdeveloped land some 10,000 miles

away. The establishment and operation of this base represents one of the greatest yet least-celebrated achievements of the war.

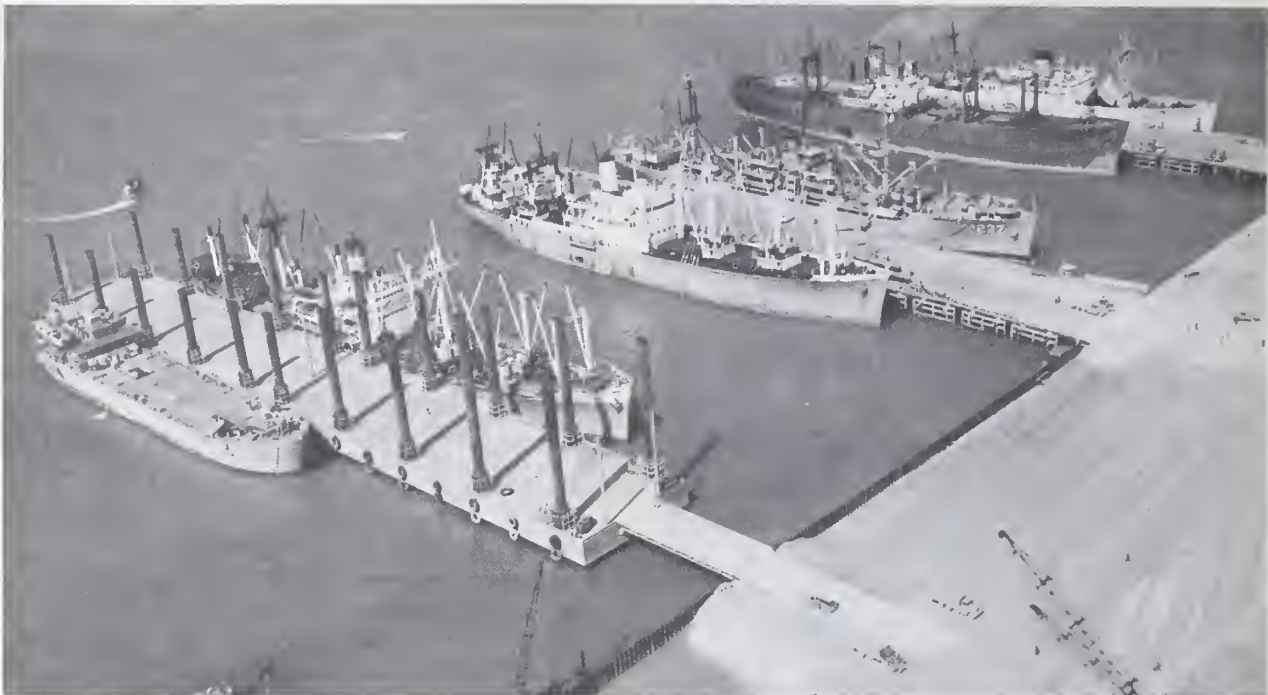
There were, of course, major undertakings here at home. Plans had to be laid, orders issued, supplies requisitioned, supply lines established or expanded, and some additional bases and units had to be created.

There were major logistic implications at every turn in the expansion of our Armed Forces by some 650,000 men in a period of 18 months. Beyond the obvious impact of this increase in numbers, there was the need to supply and equip our men specifically for the enemy they would face and the unique environment in which they would work or fight.

Difficult as it was to raise, organize, train, and equip our forces, perhaps even harder tasks were involved in moving them and in preparing a Vietnamese logistic base for their support.

As If Moving a City

Between the mid-1965 decision to deploy major U.S. forces and the end of 1966, more than 300,000 people had been transported to Vietnam. It was, as I have observed before, as if one were to move a major American city some 10,000 miles, place it in a radically new environment, and expect every aspect of its existence—public and private—to be provided for without delay or confusion, and in the face of dangers and difficulties



Six cargo vessels unload supplies for Allied Forces in the I Corps of South Vietnam onto three new deep draft piers at Danang. The new piers have increased the cargo handling capacity of the port by more than thirty percent. Previously ships had to anchor in the harbor and unload onto small landing craft or barges.



Bulldozers push through the sandy beach to a landing ship bringing construction supplies to Tuy Hoa Air Base, located 235 miles northeast of Saigon. Supplies for the air base, which was finished November 15, 1966, two months ahead of schedule, were brought from sources outside Vietnam. The U.S. Air Force supervised the design and construction of the air base.

such as most of its citizens had never encountered before.

To move such a force entailed major feats of planning, organization, and operation. We have quite literally operated continual air and sea trains from the United States to the far reaches of the Pacific. The requirements were immense. For example, in the period cited, our passenger sealift in support of Vietnam increased fifteenfold. Commercial airlift to augment our military lift expanded fourfold in the same brief span of time.

In terms of military cargo, the effort was equally impressive. Substantially more than 200,000 short tons of supplies were airlifted to Vietnam in 1966 alone. And our sealift transported millions of measurement tons more, exceeding the cargo shipped to Korea in 1951 at the height of activity in that conflict.

"From a Standing Start"

Beyond these achievements, however, perhaps the greatest logistic challenges lay within Vietnam. Here, thousands of miles away in an underdeveloped tropical land, it was necessary to provide the ports, airfields, supply depots, maintenance facilities, hospitals, troop cantonments—all of the installations required to support a major operation. It was necessary to do this quickly and to coordinate every aspect of it with the deployment of combat forces. And, with rare exception, these facilities had to be created from a standing start.

At the start, for example, there was only one major deep water port which we could use—Saigon. Now there are seven, and Saigon handles less than a third of our cargo.

Two years ago, there were only three jet-capable runways in South Vietnam. Now there are 14. Additionally, airfields capable of receiving our combat transport aircraft have been increased six fold, and fields and pads for our small aircraft and helicopters are everywhere.

As General Westmoreland pointed out to the Congress

recently, in April of 1965 there was no long-haul highway transport. But in March 1967 alone, "161,000 tons of supplies were moved over the highways."

These are just examples of the strides which have been taken, strides which had to be taken if we were to mount major military operations and support them as fully as the valor of our men deserved. Our men have been so supported. The equipment they use is largely new, unexcelled, in ample supply, and fitted to the task at hand. Their food is the envy of every veteran who ever forced down a K-ration. Medical evacuation and medical care are beyond comparison with anything known in the past. And the weight of the firepower which supports our infantry is terrifying to the enemy and lifesaving to our own forces.

A Double Salute

We give the first salute, and rightly so, to those men whose primary role is to risk their lives on behalf of their nation and the principles it defends. But they would be the first to join with me in extending another salute to all the men and women, military and civilian alike, who have worked logistic miracles in their behalf. Working under the pressures of time, in a difficult environment, and frequently in danger themselves, they have made it possible for our fighting men to turn the war around in less than 2 years and to take the initiative from the enemy. In tribute to their effort, I can only say that no fighting force in military history has been supported more effectively than our men in Vietnam.

The Confederate General Richard Ewell is sometimes quoted as saying that "The road to glory is not followed by much baggage." In the sense that our combat forces must be lean, mobile, and quick reacting, this is true today. But in a larger sense, it is untrue. "Baggage" is essential to support our men, and it has never been lost or found wanting in Vietnam. □

Seabees of Mobile Construction Battalion 40 raced the clock to complete a new cross-wind runway at Chu Lai, Republic of Vietnam, before the onset of the monsoon season. The new runway, built in 30 days, permits aircraft to land and take off during the rainy season which brings a shift in prevailing winds. A Marine C-130 Hercules transport lands on an existing runway as flight operations continued without interruption during the construction of the new cross-wind runway at Chu Lai.



ARTHUR KOESTLER refers to creativity as an "actualization of surplus potentials." When we review the tremendous strides that technology has made in actualizing the potentials of our material resources, it is difficult to believe that the development of the most important resource of all—the human one—has not kept pace. Unused material resources, Jerome Wiesner points out, are not necessarily wasted; unused human resources always are. James Gates quips, "There are times when I feel . . . that maybe this unused mental energy goes back into the universe in the form of frustration; and when there are sufficient cases like this our social system will blow up."

NURTURING CREATIVE BEHAVIOR*

By **SIDNEY J. PARNES**

*Director of Creative Problem-Solving Institute
State University of New York at Buffalo*

Talent Can Be Developed

During the middle 1950's the national research conferences on creativity at the University of Utah were focussed on the identification of creative talent. By 1959, the conference established a committee to consider the role of education in the development of such talent, not only in those identified as highly creative, but in all people. The committee then reported that at least six research projects had indicated that creative productivity could be developed by deliberate educational procedures. Since then an impressive array of scientific investigations have confirmed the earlier findings. Some of these studies have been concerned with adults, including executives in government and industry.*

Build More Alternatives

The overall purpose of programs for nurturing creative behavior is to provide for more effective de-

*All of the research is reviewed in the first 2 issues of the new *Journal of Creative Behavior* (Creative Education Foundation, 1300 Elmwood Avenue, Buffalo, N.Y. 14222), and in the forthcoming *Creative Behavior Guidebook* (Scribner's, 1967) from which this article is drawn.



cision making, including intelligent action upon one's decisions. Too often a person examines what exists, chooses the least of available evils, and acts accordingly. As James Reston put it in one of his Sunday New York Times columns:

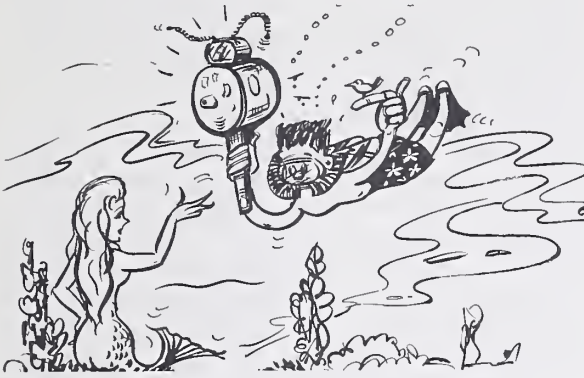
"After a while, defense of what is seems more comfortable and easier than speculation on what might be. No thought is required. The familiar round questions are dropped into the slot, and out drop the automatic answers: Smooth, tidy, stale and tasteless."

When a person makes creative decisions, on the other hand, he first speculates on what "might be" from a variety of viewpoints; then he senses and anticipates all conceivable consequences or repercussions of the variety of actions he has contemplated; finally he chooses and develops his best alternative—in full awareness.

Scale Dreams to Practicability

Of course, there is no end to the number of alternatives one could theoretically create regarding a problematic situation. Obviously this alternative-searching could be carried to a ridiculous extreme, depending on the circumstances. I might emphasize, however, that the creative solution is usually a compromise between what *is* and what one would *like to see* as an ideal. For example, suppose a student with the barest of financial means desired to have an underwater camera for use

Pressure Cooking Camera.



in skin diving. The only alternative, as it *appears* to exist for him, is to forget it, since the camera costs over \$100. The *creative* solution might be to develop alternatives such as making a suitable camera out of an old pressure cooker, as one student did in a creative problem-solving course. The camera did not solve his problem as well as the \$100 commercial product would have; but it was a much better alternative for him than forgetting it.

What Is Creative Behavior?

I define creative behavior as that which demonstrates both uniqueness and value in its product. The product may be unique and valuable to a group or organization, to society as a whole, or merely to the individual himself. Creativity is thus a function of knowledge, imagination, and evaluation. Without knowledge, there obviously can be no creativity. By way of analogy, we might consider the kaleidoscope wherein the more pieces we have in the drum, the more possible patterns we can produce. Likewise, in creative learning, the greater our knowledge, the more patterns, combinations, or ideas we can achieve. But as Alfred North Whitehead stressed long ago, education should aim at “the *effective utilization* of knowledge.” (The italic is mine.) Merely having the knowledge, the bits and pieces in the kaleidoscope, does not guarantee the formation of new patterns. In the mind, these new patterns are “ideas.”

The effectiveness of creative productivity also depends, of course, on the evaluation and development of embryonic ideas into usable ideas. Without knowledge, imagination cannot be productive. Without imaginative manipulation, abundant knowledge cannot help us live in a world of change. And without the ability to synthesize, evaluate, and develop our ideas, we again achieve no effective creativity.

Go Teleidoscopic

Perhaps you have seen a teleidoscope. It is somewhat like the kaleidoscope. However, the basic difference is this: The kaleidoscope makes patterns and new combinations only from what is *within* it, whereas the teleidoscope gets its structure from within but the raw materials for patterns and color from the *outside*, from

the changing environment it focusses upon. This perhaps gives an even better analogy of what I am trying to bring out. That is, there are elements within the structure of a person that are a part of his total being, his total life experience. These are played upon constantly by the external input through his senses. The person's creativity depends, then, on his ability to relate not only what he already has within him, but also that which comes from outside him.

Creative Leadership vs. Leadership for Creativity

An organization can be creative primarily in the sense that its leader is highly creative and directs the personnel autocratically in implementing his creative ideas. On the other hand, an organization can be creative primarily because its leader subtly stimulates the creative productivity of the individual members. In the former organization, the main rewards to the individual are apt to be those which are customarily enjoyed off the job—salary, vacations, and those benefits that are meted out by the leader—or, at best, environmental and social conditions that an individual enjoys on the job. Primarily, however, the benefits are tangible.

The organization that provides for creative growth of the individual is one wherein the intrinsic satisfactions are often greater than the extrinsic rewards—for example, the sense of contributing a major portion of *oneself* to the job, or the sense of self-expression being tangibly rewarded. The individual in this type of organization is too busy applying his creative energies to a job or his studies to watch a clock. He becomes *totally* involved in the tasks at hand. In the process, he discovers *himself*.

The Selective Conformist

Basic to all attempts to nurture creative behavior is the attempt to break the individual away from “blind” conformity so that he can make fresh and meaningful associations. I use the term “blind” conformity to differentiate from deliberate or purposeful conformity. For example, I purposely conform, sometimes, to the custom of standing in line to purchase a ticket—for good reason. Similarly, for reasons of efficiency and convenience, I usually eat my meals at the *customary* hours. I deliberately, though reluctantly, conform to the idea of wearing a white shirt and a tie when I attend a business meeting. Although I feel that it is an unnecessary custom for which I could invent much better alternatives, there are many more pressing problems to which I now want to devote my energies than to that of convincing society that we should be allowed to change our manner of dress.

I may be bold enough not to conform to the custom of eating my peas with a fork. The physical comfort and efficiency of using a spoon may compensate for the social discomfort I feel while violating a social norm. I will not conform, however, to some prevailing notions of educational practice. Or to religious dogmas. Or to

popular ways of thinking with which I disagree. One youth expressed this idea vividly when he proclaimed, "You can make me cut my hair, but you cannot make me cut my ideas!"

In other words, conformity in behavior may sometimes be desirable or even necessary to a creative life, but conformity in thinking is demonstrably detrimental to the fullest creative growth.

Smothered Inspiration and "Unkissed Inspiration"

When we conform to prevailing norms, we are seldom guilty of an error of commission. But what about errors of omission? For example, on a sweltering July day, I was introduced to a formal luncheon group in a restaurant that was not air conditioned. When I arose I began my speech by taking off my suit coat and inviting all the men in the audience to join me. My suggestion was greeted by a hearty round of applause. Yet had I not proposed it, I would have been perfectly safe, hardly likely to have been criticized. But the reaction I received proved that I would have committed an error of omission had I not suggested it once it had occurred to me.

Errors of omission can be just as costly as errors of commission. In this instance just mentioned, I would have unwittingly sacrificed a certain amount of audience receptiveness to my speech because of the men's discomfort. Moreover, by my act I gained more receptiveness, I feel, than I might have had under even better circumstances. And lastly, my own comfort and self-confidence was probably a major factor in presenting a successful, well-received speech.

Errors of omission are much less likely to be detected than errors of commission. If I do not act upon an idea which later proves to have been "right," I myself may be the only one aware of my mistake. However, if I act and am wrong, my error is usually obvious to others. Most of us, through fear of some form of ridicule, tend to play the game safe, bringing forth our ideas only when we are sure of their worth and acceptance.

Most people are probably more concerned with meeting each situation in the same way as they met it before, but making fewer "apparent" mistakes each time, than in finding new and imaginative ways to solve their problems. We let our "unkissed imaginations" become our ulcers, as John Ciardi puts it.

Do-It-Yourself-Thinking

You may have heard of the chap who was given a rather complicated piece of machinery to put together. He was left alone with it for a few hours; then the supervisor returned with an instructional manual, which he had forgotten to give the man. But to his great surprise, the supervisor found that the job was completed; the machinery was all assembled. He asked the worker how he had ever gotten it together without the manual of instructions. The man replied, "That wouldn't have done me any good, because I can't read. But I learned a long time ago that if you can't read,

you have to learn to think." George Bernard Shaw once claimed, "Few people think more than two or three times a year. I've made an international reputation for myself by thinking once or twice a week."

Spoon-Feeding Kills Initiative

We receive so much spoon-feeding in our present society in terms of how-to-do-it instructions—in school, at home, and at work—that many people lack almost any opportunity for being creative, and consequently they fail to develop or retain the attitudes and abilities necessary to meet new or changed conditions comfortably and confidently. The instructions accompanying a new doll our daughter received are symptomatic of the problem. They began, "How to Have Fun and Play with Your New Doll." What an invitation to mental unemployment! Warren Rhodes, an industrial executive, reported at a recent conference that only 10 new junior executives out of 200 responded well to an opening assignment to "look around for a few months and then tell me what you want to do." The other 190 found this too unstructured and insecure a situation for them. Rhodes maintains that we live in a wonderful age—whatever we want we can get; the problem is what we should want.

Incubation

Before leaving any discussion of creative behavior, it is important to mention the phenomenon of incubation. It refers to the period in the creative process when the creator is not involved in conscious activity with respect to his problem. Often during or after such a period, insights or ideas seemingly "well up" from within the individual. A pertinent example concerns a little girl who had been trying for several days, to no avail, to reinsert a rope-belt into her pajamas. One afternoon while rushing in from play to get an ice cube from the freezer, the idea suddenly occurred to her that she could "freeze" the rope into a circle or horseshoe by wetting it and placing it in the freezer, after which she could easily slide it through the opening in her pajamas. Countless anecdotes in the literature recount instances of breakthroughs in difficult problems when a person is detached from conscious attention to the problem.

Rope Trick.



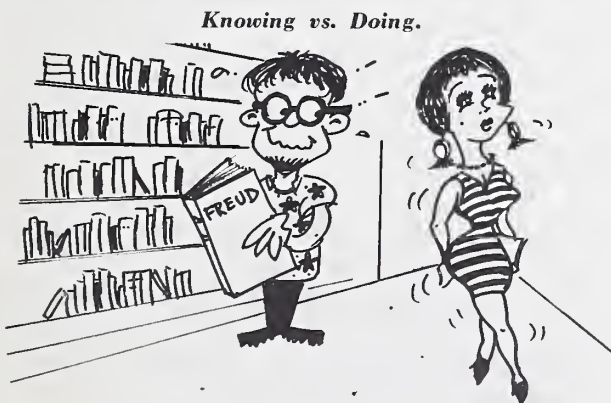
Experience Doubled Output

Creative behavior courses will typically provide a good deal of practice in deferring judgment, in “playing” with ideas and “forcing” new relationships, in alternating between involvement with and detachment from the problem. Striking evidence of the value of such practice experience was provided by a study of novices and those experienced with the use of deferred judgment at State University of Buffalo. Even though both groups were given the intellectual set to defer judgment, relate freely, strive for quantity of alternatives, etc., the experienced subjects, equivalent in all other respects to the naive group, outproduced the novices (in the same length of time) approximately two to one, on both quantity and quality of ideas in solution to a problem. The results were highly significant statistically.

Knowing versus Doing

Furthermore, I feel that it may be more than a matter of sheer practice that increases one's creative ability. I question whether a person can fully understand—fully appreciate—the meaning of concepts like deferred judgment until he internalizes them. As Wallace Andrews, an instructor of creative problem-solving courses, says, “You can learn all you want to about Freud, but sooner or later you have got to go out with girls.” Knowing and doing are two different things.

At noon of the last day of a creative problem-solving institute, a top executive of a company remarked, “If you could only have gotten us into this frame of mind before we came here, we could have accomplished so much more!” I explained that a major objective of the institute was to develop just such viewpoints as he was now experiencing. I also explained that we had talked about such attitudes in our opening orientation, and that we had then proceeded to provide experiences that developed the desired frame of mind in the participants. The initial talking about it hadn't produced a change. “Aha,” the executive suddenly recognized, “I see now, and you have certainly accomplished your objective.” He realized that he was then ready, as a



Shaping the Idea.



result of the experience, to go back to his company and take advantage of the new viewpoints and attitudes in facing company problems.

Change Takes Practice

Moreover, when unaccustomed to it, the person may find strange and uncomfortable the type of thinking that is required for maximizing the uncommon associations in creative thoughts. He may have lived too long in the cultural cocoon. Ashley Montagu once quipped that all man wants nowadays is a womb with a view.

For a man who wants to emerge from the cocoon, creative behavior will necessitate quite a radical change in his thinking. And as with most changes, he may have to practice using it for quite a while before he appreciates its worth. It may be analogous to teaching a person to abbreviate his name by writing every other letter. Sidney Parnes would become Sde Pre. If acceptable, this would obviously be a faster and simpler way to write my name—but not until I got used to it. Until then it would probably take more time and concentration than the present longer method—and I would probably resist it.

The Creative Person

I might summarize by saying that the individual who behaves creatively is oriented toward setting and solving problems, using an inner drive to recombine his storehouse of experiences in new ways. In attacking his problems, he does not behave as a conformist instead, he pioneers often, is not afraid to fail frequently, but is productive in the long run.

Perhaps the nature of the person who behaves creatively can best be dramatized with this story: A little boy saw a sculptor begin his work on a solid granite block. As he passed by on his way to school each day he paid little attention as he heard the sculptor chipping away at the block. Then one day his attention was caught by the emerging shape of a fully formed lion, and he exclaimed, “How did you know it was in there?” The creative man “knows” it is there. As Michelangelo reputedly said about a piece of marble, “There is an angel imprisoned in it and I must set it free.” □



SP5 Rosa Hernandez is shown as he conducts a special class for Spanish speaking trainees at Fort Gordon, Ga. Hernandez prepared the lesson plan for the classes which are held to complement regular basic combat training. Mrs. Suzanne Hitchcock, inset upper right, Language Coordinator, developed the special classes in order to reduce the number of trainees failing basic training because of language difficulties. The program has saved an estimated \$426,384 in re-cycling costs since its inception.

PROBLEMAS DE LENGUAJE SON ELIMINADOS RAPIDAMENTE

If the above caption leaves you cold, how do you reckon Spanish-speaking trainees react to English instructions articulated in the clear, dulcet, bell-like, soft-spoken tones that first sergeants always use. Right—not too well.

There was a time when 18 out of 90 Spanish-speaking military trainees flunked proficiency tests at the end of basic training. The result was a repeat course for the failing 18 trainees with recycling costs running to \$1,008 per trainee (not even counting all of the overhead expense).

That was "once upon a time" because, at last look, the 20 percent flunk-rate had dropped to one one-hundredth of 1 percent.

Who came along to change the picture? Two people. One was Maj. Gen. Walter B. Richardson, who glimpsed the pass-no pass statistics and ordered something to be done and "done fast." The other person was Mrs. Suzanne Hitchcock who did something—and fast. Mrs. Hitchcock is a language coordinator at Fort Gordon, Ga. Mrs. Hitchcock found that the language barrier prevented one out of every five Spanish-speaking draft-ees from understanding the basic orders.

From there, staff commanders and education center personnel got together on a plan that has since resolved

the language problem. Ten days after General Richardson gave his order, the plan went into effect. Here is how it works.

All Spanish-speaking personnel are administered the English Comprehension Level Screening Test upon arrival at Fort Gordon. Trainees scoring less than 80 percent attend special language classes. The 2-hour class sessions are held twice a week for 6 weeks. This instruction, which is in addition to the soldier's regular training, covers English, military terminology, and subject matter from his regular combat lessons. SP5 Rosa Hernandez, a language specialist, compiled a digest of manuals which is used as the instruction outline.

Just how effective is this special training program? Only one of the last 750 trainees taking the course required recycling in order to complete his basic combat training. Approximately \$426,384 has been saved since the program started.

Mrs. Hitchcock sums it up this way: "The end result is fewer lost man-hours, substantial monetary savings, and a trained soldier in the shortest possible time."

Mrs. Hitchcock has been awarded a Department of the Army Commendation Certificate by Army Cost Reduction Program Manager, LTG L. J. Lincoln, in recognition of her outstanding contribution.

Afloat Support For—



ARMY AIR MOBILITY

Floating Maintenance—An Evolution

The requirement for floating maintenance facilities II the Army Air Corps used a version of this concept has been recognized for a long time. During World War to support aircraft. For many years the Navy has had tenders to maintain seaplanes and other equipment off-shore. The Army has floating maintenance ships to support its marine fleet. Therefore, the idea of having a floating maintenance facility to support Army aircraft has been evolutionary rather than revolutionary. With the development of new Army air mobility concepts in 1961, the potentials of a floating maintenance facility were again explored.

In 1961, Secretary McNamara directed that a new look be taken at Army air mobility concepts. The specific objective was to exploit aerial vehicles as a means of moving Army combat troops about the battlefield with relatively little hindrance from terrain. As a result of this direction a study was made by a group known as the "Howze Board." The Howze Board developed new air mobility concepts and practices and the initial work of getting the hardware to support them was begun. Since that time there have been many followup studies of Army air mobility. These, in conjunction with the experience gained in Vietnam, have resulted in significant advances in Army air mobility concepts.

By LT. GEN. L. J. LINCOLN

***Deputy Chief of Staff for Logistics
Department of the Army***

Time, Tempo and Technology Multiply the Pressures

Meanwhile the Army aircraft inventory has increased from 5,000 to approximately 9,000 aircraft with future increases projected for a total of nearly 12,000 Army aircraft in the 1968-70 timeframe. Importantly, in 1961 50 percent of the inventory consisted of relatively simple fixed wing aircraft in the low and slow category. Now, 70 percent of the inventory is composed of rotary wing aircraft which are much more complicated to maintain, and this ratio will go to 80 percent rotary and 20 percent fixed wing by 1970.

While these large increases in inventory have been taking place the aircraft systems are operating at much higher flying hour rates. In 1960 the average flying hours per aircraft per month worldwide was 23 hours. This rate is being almost doubled in 1967. In combat the rates are much higher than originally forecast; for example, in Vietnam a large portion of our helicopter fleet is averaging over 70 hours per month per aircraft under most difficult conditions.

The Problems—and the Answers

In light of the foregoing it was imperative that new logistic support concepts be developed to keep pace with air mobility concepts and the rapidly increased inventories and flying hours. Meeting this requirement posed two specific problems: First, to provide direct support

on the battlefield with a minimal impact on operations; and secondly, to give backup support at the GS/depot maintenance levels that would be both quickly responsive and effective for long-range considerations.

For the forward area of the battlefield we have developed some new maintenance concepts and improved older ones. In Vietnam many of the operating units in the field now have an integrated direct support (DS) maintenance detachment capable of performing relatively difficult maintenance at the site of operations, and some of the DS maintenance capability has been made completely air mobile. To date, operational readiness and flying hour rates in Vietnam indicate that we are on the right track. However, our concepts and practices need further refinement. We are taking advantage of Vietnam lessons to accomplish this.

The second requirement dictates that we must be prepared to support Army aircraft almost anywhere in the world on short notice. A principal difficulty here has been our inability to airlift and install in a suitable working environment many of the heavy and bulky tools and equipment needed to maintain Army aircraft systems. Accordingly, our thinking centered on a means whereby we could marry up Army aircraft operating units which are air transportable, with aircraft maintenance units and equipment which would move and operate afloat. The Floating Aircraft Maintenance Facility (FAMF) concept provided a potential solution.

The USNS CORPUS CHRISTI BAY is a Floating Army Aircraft Maintenance Facility (FAMF) operated by MSTs. The depot-level maintenance is performed by the Army's 1st Transportation Maintenance Battalion (Seaborne). Now in operation in Vietnam, it receives and delivers much of its work by 20 helicopter deck landings a day.





This shop is provided with equipment to repair and balance fixed wing propellers and to test and repair component parts of the CH-47 and other helicopter rotor blades.

The FAMF Concept

The Army was faced in the long range with a requirement to support contingency plans, and immediately to support Vietnam. In October 1962, General Besson, Commanding General, U.S. Army Materiel Command, proposed that the Army approve a concept to provide a floating maintenance facility for Army aircraft and proceed expeditiously to secure the required ship, manning and materiel. After much backing and filling, mainly concerned with mission, size and cost effectiveness, we settled on a seaplane tender—the USNS Albemarle—which was being mothballed by the Navy. The original concept that sold the FAMF is outlined here.

The primary mission of the floating maintenance facility will be to support contingency plans. It will provide an offshore, industrial type aircraft maintenance element, immediately responsive to emergency requirements, which will be able to diagnose and test, and repair and return to the user, high cost reparable components, engines and aircraft that would normally require return to CONUS. The maintenance element will also be able to fabricate “bits and pieces” for repair parts and accomplish other aircraft maintenance work beyond the capability of any fully mobile unit the Army currently possesses. A land-based mobile maintenance unit with a like capability could not be placed on shore during contingency or emergency operations in a comparable time. Additionally, much of the land-based facility would have to be housed in permanent-type buildings with concrete hard stands, and dehumidification and controlled temperature equipment as well as other sophisticated accessories. The floating facility is not intended to replace the Heavy Maintenance and Supply (HM&S) Company as the basic aircraft field maintenance element in the Army. Depending on the nature and location of an emergency, the facility may precede an HM&S Company throughout an emergency.

The floating maintenance facility can be utilized in

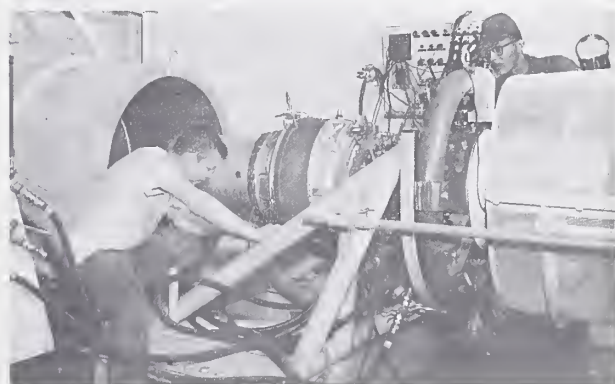
the basic mission of aviation maintenance throughout its life in peacetime or in an emergency, except when en route to or from overseas. Peacetime assignments will be interim in nature to assure that the floating facility will be immediately available for its primary mission—to respond to an emergency. Offshore interim assignments will support large scale exercises or take care of peak workloads in Europe or the Pacific. These tasks can be performed offshore or onsite in the Continental United States (CONUS). CONUS interim assignments will supplement or augment in-house and contractual maintenance. This can be done without creating a vacuum in the aviation maintenance capability when the facility moves out. Overhaul contracts have clauses permitting minimum/maximum, input/output schedule variances. The allowances are of sufficient size to enable maintenance schedules to apportion the interim work being done by the facility to military shops or contractors when the facility is required for another mission.

Services Land Equipment Too

The mission of the floating maintenance facility has been oriented toward aviation maintenance because of the cost and sensitivity of aviation materiel, which requires highly specialized skills and critical tools and equipment for test, diagnosis, and overhaul tasks. The facility will be capable of supporting land equipment and surface vehicles when not fully utilized in support of aviation operations. For example, radios, electronic equipment, and armament can be repaired and overhauled, and “bits and pieces” can be fabricated for other than aircraft with the skills and equipment on board the floating facility.

The maintenance work on the FAMF will be performed by military personnel. The ship will be operated by the Military Sea Transport Service (MSTS). The MSTS crew, in addition to operating and securing the ship, will perform a preponderance of administrative

This turbine engine test cell has the capability of simulating operating conditions for T53 and T55 Lycoming Gas Turbine Engines subsequent to repair and prior to issuing to the troop users in the field.





Major items of equipment tested and repaired in the hydraulic shop are propeller governors for U-1, U-8 and O-1 aircraft and T53 engine hydraulic components. This shop also has the capability of fabricating hydraulic hose and fittings used by all aircraft systems and many other items of equipment.

and housekeeping tasks for the Army maintenance element—thereby freeing these personnel to perform their primary duties.

Through Gestation to Birth

Conversion of the Navy seaplane tender into an Army helicopter tender was approved by Deputy Secretary of Defense, Cyrus Vance, in August 1964. Congressional approval was received in September and work was begun in the Charleston Navy Yard, Charleston, S.C. Under the original concept, airframes were to be overhauled as well as engines and assemblies. However, there were definite limitations on the number of aircraft that could be placed on board for overhaul (26 UH-1's) and with the sizeable increases in aircraft inventory in Vietnam (from approximately 300 in 1962 to over 2,000 in 1967) airframe overhaul became less attractive than the requirement to test, repair, and return to the user critical components on a selective basis to support the entire fleet. Accordingly, during conversion, the airframe capability was dropped and more equipment was added for component overhaul and testing. As a first-time project, many problems were encountered during the conversion period. As the FAMF project manager put it, "the gestation was much more difficult than the conception." The FAMF, now designated USNS Corpus Christi Bay, was delivered to the Army in January 1966 and after a shakedown cruise and provisioning at the

home base in Corpus Christi, Tex., the facility arrived in Vietnam in April and went to work at Cam Ranh Bay.

FAMF's Role in Vietnam

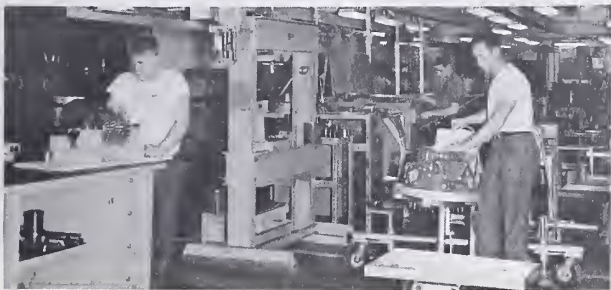
The normal role in Vietnam is that of a general depot level repair activity. The facility receives work, which for the most part is scheduled from retrograde stocks of unserviceable components. The 34th General Support Group, operating the aviation supply system for U.S. Army Vietnam through the 58th TC Battalion Aircraft Materiel Management Center, Tan Son Nhut, prepares workload forecasts and directs the collected items to Vung Tau. The FAMF staging area shore unit accepts delivery and, in coordination with the production control section for scheduling and the Army deck crew for transportation, moves reparable to the ship. All repair parts and supplies are also passed through the shore element.

Facility boats or helicopters move cargo, providing ship-to-shore service. Some 40 tons a week are moved by this method. Other work comes aboard by unit helicopters such as the CHINOOK (CH-47) of the 1st Cavalry and the Sea Knight (CH-46) of the 1st Marine Wing. The Army helicopter deck handling crews, who work both fore and aft pads, launch, service, and recover as many as 20 helicopters an average day.

The FAMF has been most valuable in performing the primary tasks of testing and repairing aircraft en-



The ship's avionics shop is capable of performing organizational through depot maintenance overhaul and repair of much of the communications and navigation equipment installed in Army aircraft.



The engine shop is probably the most important shop on the FAMF. It is capable of inspecting, repairing, and returning to the users engines that have not reached mandatory overhaul time.

gines and components and returning them to the users. However, its versatility in performing maintenance is being widely used. Examples are:

- \$2.9 million worth of aircraft components are made serviceable and returned to customers each month. These include gas turbine engines, fuel controls, transmissions, gearboxes, etc.
- "Bits and pieces" (e.g., hydraulic hose assemblies) are fabricated and provided to the 34th Group to cover NORS (Not Operationally Ready Supply) requisitions. When a requisition is received, economic quantities are produced to cover potential requirements in the future. During the first 5 months of operation, an additional 4,000 days of aircraft availability was provided to U.S. Army Vietnam as a result of repair parts which removed aircraft from deadline.
- Maintenance engineers and the metallurgists and chemists assigned to the FAMF provide technical advice, assistance, and technical analysis to the Army, Air Force, and Marine Corps.
- Nearly 5 percent of the maintenance effort is spent on maintaining and/or rebuilding nonaviation items for combat and combat service support units such as flamethrowers, countermortar radars, airboat engines for special forces, pumps for a floating crane, adapters for multifuel dump trucks, bits for a quarry drill rig, and generator and vehicle batteries.

The mobility and flexibility potentials of the FAMF have been well tested in Vietnam since arrival. The initial site was Cam Ranh Bay where the facility performed a maintenance mission composed of roughly one-half scheduled and one-half opportune and emergency work. Then for a 30-day period the FAMF was placed at Qui Nhon in close support of the 1st Cavalry Division. Now the facility is at Vung Tau where it is directly astride the retrograde pipeline with approximately 75 percent of the work being done on unserviceable components and assemblies and with a much greater control and scheduling of workload being exercised by the Aircraft Materiel Management Center, U.S. Army Vietnam.

The Future

As stated in the basic concept, FAMF has the capability of performing productive maintenance in peacetime while being prepared for potential contingencies. One of the greatest advantages of the concept is the fact that the facility is satellited on the Army Aviation Depot Maintenance Center (ARADMAC) for mission supply support, and for mission workload when not under the operation of an overseas command. In this manner, FAMF requirements and capabilities complement and do not compete with the CONUS depot maintenance workload.

We are taking a look at the requirement for a second FAMF. This facility would be very much like FAMF No. 1 and could work as a backup and replacement ship in conjunction with, or completely independent of, the current FAMF. The secondary mission would be to remain productive. There will be plenty of aircraft maintenance work during peacetime to fully employ both facilities without significantly affecting the CONUS depot workload.

Other studies are being conducted to develop the feasibility of a floating facility to repair airframes overseas and to have mobile collection and classification points (e.g., LST's) where unserviceable components can be segregated and fed into the FAMF or prepared for retrograde shipment.

Studies are also being conducted to consider the use of surplus Navy ships for maintenance of components for ground mobile and fixed mechanical equipment as well as missiles and electrical equipment.

The FAMF concept is proving itself daily in Vietnam. There are many potentials for expansion of the concept to more extensive aircraft maintenance work and in support of other systems. We believe that the FAMF concept may well become a way of life in Army maintenance wherever it can effectively move a comprehensive maintenance capability forward with the troops to provide a shorter pipeline and a more responsive logistic support system. □

THRIFTY PASSAGE FROM DEPOT TO PORT



—Barging Down Ole Man River—

Using the same water route followed by explorers Lewis and Clark in their historic quest for a Northwest Passage, Umatilla Army Depot, Hermiston, Oreg., is saving thousands of dollars daily in transportation, labor, and dunnage costs for movement of military cargo. The depot is ideally situated to take full advantage of the mighty Columbia River in barging cargo direct to ocean ports. In the above photo, which shows part of the shop complex and a section of its 1,015 munitions magazines, the Columbia River appears between the upper edge of the depot and the foothills.

Ammunition and supplies destined for Vietnam and other areas are moved a short distance to the river,

Rocket motors and other munitions items are thoroughly checked and made ready for shipment.



loaded onto barges, and taken to the ocean ports where the cargo can be loaded on waiting ships from ocean-side while other cargo is being loaded simultaneously from trucks or railcars on dockside. Col. Herman Hoplin, Depot Commander, states that savings equal to \$3,200 per barge-load were realized last year through use of this simple but effective transportation and loading method. The easy, fast, and economical use of barges for transportation of supplies is arranged through the Military Traffic Management Service.

The pictures below and on the following page illustrate how the system works.

The cargo is palletized in preparation for the first leg of the journey from the depot to the river barges.





The cargo is loaded onto trucks for the first leg of the journey.



It is a short jaunt to the Columbia River shore and the waiting barges where busy cranes empty a truck within minutes.



Upon reaching the port area, the supplies are transferred to the hold of a waiting cargo ship for the long journey to Vietnam or other overseas destinations.



A loaded barge moves along the river on its way to the designated ocean port.

MOTIVATION—FROM NOT-SO-ANCIENT MARINERS

Samuel Taylor Coleridge once said, "No man does anything from a single motive."

So believes the Naval Air Rework Facility at North Island, San Diego, Calif. That activity puts the cost reduction message across in a variety of ways—knowing that headquarters pronouncements, in and of themselves, seldom set off spontaneous bursts of widespread enthusiasm!

To date, that Navy activity has racked up an enviable record of cost reduction achievement. It has a half dozen presidential citations to prove it. Assigned savings goals have been exceeded by as much as 250 percent.

Its success formula lies in the fact that the commanding officer, Capt. R. D. Greer, Jr., has demonstrated to one and all that cost reduction is a matter of high individual concern to himself personally as well as a matter of organizational policy. A recent statement by Captain Greer illustrates the point: "I want to stimulate the thoughts of all military and civilian personnel to greater cost reduction efforts. This program is vital to our con-

Captain R. D. Greer, Jr., Commanding Officer, Naval Air Rework Facility, North Island, California, reviews the first of a series of Cost Reduction Posters to be displayed throughout the station. Assisting is Miss Nancy Koppes who was selected to represent the installation as "Miss Cost Reduction—1967."



tinued support of the fleet. Every dollar saved through reduced costs provides an equivalent increase in productive output without additional funding. The cost reduction program is not a shortlived drive. Its purpose is to assure a continuing awareness of the need for cost reduction in all areas of our work!"

Greer and his staff assistants in the Management Controls Department, mindful of Mr. Coleridge's wise observation, recognize that a great number of motivating factors must be blended together to create an effective, continuing program.

They had good, basic materials from which to build: Value Engineering, Beneficial Suggestions and Project ROC (Reduce Operating Costs) programs.

A master plan was drawn to integrate existing programs with several of the newer motivational devices. The plan was based on the concept that recognition of personal contribution or effort is a powerful motivating factor. Consequently, particular attention was devoted to making sure that each individual contributing to the program would be recognized in some manner. This recognition took various forms, such as monetary awards for savings suggestions, public presentations, pictures and articles in local newspapers, letters of appreciation, and commendation certificates.

Bright and colorful posters were prepared and distributed to all shops and offices within the command and its tenant activities. Large outdoor signs were constructed and placed at the main entrances to the installation.

Pretty Miss Nancy Koppes, a clerk-typist, was selected to serve as "Miss Cost Reduction" for 1967. Besides adding glamor to the drive, she distributed promotional materials, presented awards, and posed for publicity releases.

Organizational responsibilities were assigned, working groups were made responsible for specific cost reduction areas, and key individuals were selected to coordinate, collect, and forward ideas.

The command's cost reduction coordinator conducted a series of briefings and prepared a cost reduction brochure to document the *modus operandi* of the plan.

Captain Greer is already looking around for more innovations to sharpen and sustain interest in the program. He has over 50 new poster designs to draw from, a sharp eye out for "Miss Cost Reduction—1968" candidates, and a myriad of promotional ideas to be tested in the next few months.

His objective—a successful cost reduction program now and in the years to come.

MECHANIZED MATERIELS HANDLING

By LT. GEN. EARL C. HEDLUND

Director, Defense Supply Agency

Objective—Faster Service

A stock picker at the Ogden, Utah, depot of the Defense Supply Agency completed his selection of items, placed the last package on a small cart, engaged a pin in the front of the cart with a slot in the floor, and went back to begin picking another order. The cart moved quietly away, traveled to a discharge station, was automatically unloaded, and returned, stopping automatically, at the picker's station.

Sound mysterious? It's not, really. The stock selector, the cart, tow conveyor, and discharge station all are parts of a mechanized materiel handling system developed for DSA's depot structure with the pilot installation recently placed in operation at the Ogden Depot.

The Ogden mechanized system is part of a general DSA mechanization program designed to improve the supply support capability of DSA by reducing the delivery time of supplies to military customers.

The mechanization program is being conducted in the Depot Operations Division, headed by Col. D. M. Scott, Jr., USA. Managers of the program are Mr. Peter G. Andricos and Mr. Charles F. Fogarty who challenge the status quo of handling methods of the past with their motto, "methods should dictate required hardware. Hardware should not dictate methods." This philosophy is borne out by the overall system.

The need for improved materiel handling was recognized soon after the Defense Supply Agency began

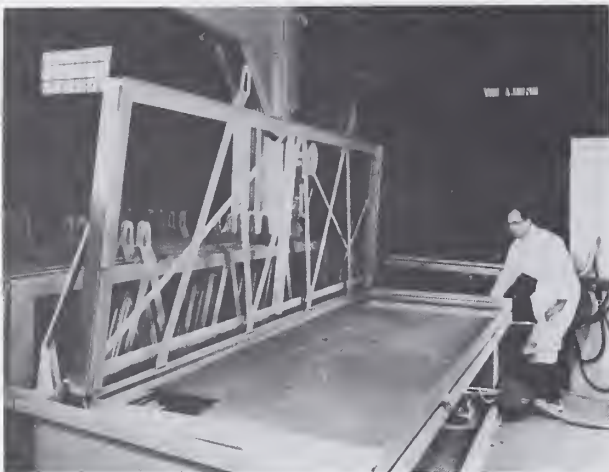


taking over supply management responsibility for some 1.4 million items of common-use supply in the Department of Defense. Many of the depot installations absorbed into the DSA distribution system were not adapted to the Agency's defensewide mission of fast, efficient support of all military customers with a broad range of supply items. Methods and equipment had to be developed to assure timely DSA support with the responsiveness characteristic of military operations.

Likened to Mail Order Business

Warehouse operations at the time DSA went into business were characterized by storage of bulky materiel of infrequent issue. The new concept under which DSA would conduct its business would require fast movement of a wide range and variety of military supplies. In a sense, DSA would be in the mail-order business, furnishing subsistence, clothing, textiles, medical, industrial, electronic, construction, fuel and general supplies to customers in all military services.

Warehousing equipment, which served well under the old concept, would no longer be adequate to meet DSA's requirements. What was needed was the capability to receive supplies and rapidly assimilate them into a storage complex to permit fast identification and location for quick movement out to meet military needs. This called for more specialized storage facilities and materiel handling than the old system possessed.



These folding "envelopes," which permit easy access to metal sheets of various sizes and hefts, are being installed at Memphis and Tracy Depots.

Studies showed that the most profitable area for improvement was in the large number of loose-issue, binable items supplied by DSA.

Well Researched Plan

Considerable time and effort were expended in research and investigation of available materials handling systems and equipment to determine which would meet DSA's system requirements. Numerous studies were conducted at industrial, as well as military, installations. Materials handling systems data were thoroughly analyzed and designers and users of equipment were consulted to determine the most effective principles and means to be incorporated into the DSA system. For the loose-issue operation, certain principles evolved and equipment characteristics were developed which guided the design of the Ogden mechanized operation and which will be the pattern for installation at other DSA depots.

In designing the Ogden system, simulated workloads were developed and fed into computers at the University of Utah. The results were then used extensively to determine rates of flow, equipment capacities needed, processing times at points throughout the system, and to smooth out potential problems. The simulation technique proved valuable in anticipating trouble spots in the Ogden system, and permitted corrections to be made before the hardware procurement stage was reached. The same technique is being used in designing systems for all other DSA depots.

The Guiding Principles

Six basic concepts have been applied—with efficiency, expansion capability and cost reduction uppermost considerations in the planning, designing, and implementation of the system.

(1) The DSA system of mechanized handling of

material emphasizes the principle of mobility by minimizing separate handlings. This is achieved by introducing material into the mechanized flow at the earliest practicable point, and by automatically moving material to the point nearest the next operation. Each eliminated manual handling step results in reduced processing cost.

(2) Efficiency is further increased by applying the concept of controlled workload, including scheduling and matching the volume of workload with staffing available at each work station.

(3) The principle of straight line flow from receiving to storage, to packing, and finally to shipping is adhered to. The tow conveyor system at Ogden makes a double penetration of the bin storage area providing a shorter distance between the conveyor and the storage locations. This reduces the walking distance for storage and stock selection operations by 35 percent from the distance required in the conventional, single penetration system.

(4) Expansion capabilities have been incorporated to accommodate a mobilization situation. Engineered for an optimum 4,000 receipts and 15,000 line item shipments per 8-hour shift, the production rate can be easily increased by adding multiple shifts. This flexibility has been repeatedly demonstrated by the Ogden system.

(5) Costs have been reduced by consolidation of like activities within the system, e.g., receiving is centralized, packing is centralized, shipping is centralized.

(6) Maximum advantage has been taken of computer capabilities to support the system. Information is provided rapidly by the computer on storage location and necessary inspection and verification data for use on the processing lines. The computer also prearranges stock picking schedules and establishes shipping consolidation patterns to meet military priority require-

Each of Ogden's three telescoping conveyors at the binable items center can penetrate 35 feet into the carrier and discharge cargo directly onto receipt accumulation lines. Conveyors can pivot to serve two unloading points.



ments. By using the computer in batching stock picking lots and scheduling workload into the system, the objective of minimum man force and maximum system output can be realized. Also, computer-prepared documentation expedites movement of materiel through the system by preparing documentation simultaneously with workload movement.

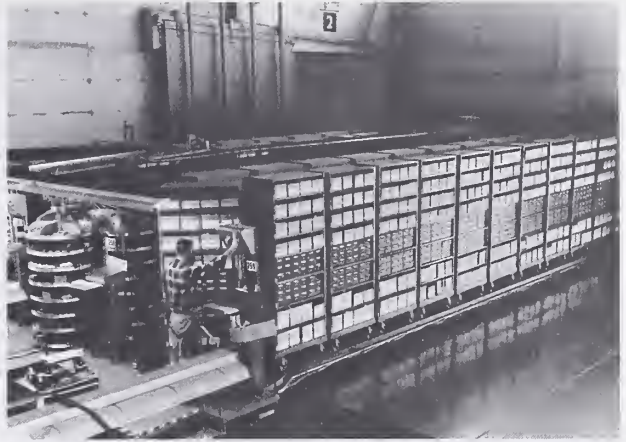
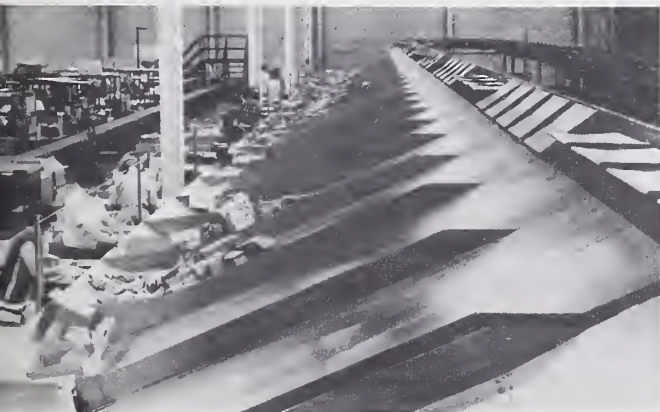
Receiving

Ogden Depot's mechanized handling of supplies begins in the receiving area of the binnable items warehouse complex. Cargo is unloaded from trucks onto a telescoping conveyor which can penetrate into the truck about 35 feet. Containers with the materiel from the trucks are moved by powered conveyor to accumulation lines where they are inducted onto a high-speed, mechanical, tilting-tray sorter. This high-speed sorter is capable of receiving and sorting some 3,600 containers each hour. An endless chain of tilting trays receives incoming cartons and diverts them to one of 17 lines at the rate of 60 trays per minute.

On the staging lines, items are grouped or segregated by stock number, packages are opened and dunnage and packing materiel is placed on an overhead conveyor for removal. Nonmission and bulk storage items are routed to an outloading point from which they are delivered to the appropriate building by a cargo transporter which is a mobile conveyORIZED platform permitting a single operator to load, transport, and unload cargo without assistance.

After storage location is determined by computer from an inquiry station, the materials move from the staging lines through another high-speed sorter to processing lines. On these lines, the required inspection, identification or verification is performed. Receiving documents are completed and are then forwarded to the office by an overhead document conveyor.

Line items are automatically diverted from the tilting trays of a high-speed sorter into chutes for consolidated shipments to a single customer. Orders for 500 customers can be consolidated at one time.



Ogden Depot's "carrousel" brings the storage bin to the stock picker, giving him handy access to 3,288 individual stock locations.

Storage

Completed items are next moved by power conveyor to another sorter where they are diverted into chutes corresponding to their storage location. Items which are not to be stored in the mechanized center are moved by conveyor to a collection point where they are removed to the storage warehouse by cargo transporter trucks.

Items to be stored in the mechanized center are transferred from the accumulation chute onto conveyor carts for movement to their storage location. About 700,000 line items of binnable supplies are stored in the mechanized center with the fastest moving items being stored in the four warehouse sections between receiving and packing. It is estimated that 80 percent of the demands will eventually be filled from this area.

A conveyor cart is used to transport stock into and out of the storage complex. Carts can also be converted to stock picking or warehouseman's carts by adding a lightweight handle. Carts are moved by a conveyor tow chain running in a narrow channel embedded in the floor. The channel is flush with the floor surface, permitting tractor and forklift traffic unobstructed passage. Some 450 carts are moved nearly 2 miles through the four-warehouse complex in storing receipts and selecting stock for shipment.

Each cart is equipped with a coding device which the operator sets for the designated storage location and then attaches the cart to the conveyor. The tow chain pulls the cart to the storage location where it automatically stops and the warehouseman pushes the cart to the bin locations where he stores the materiel in a rack or bin.

Shipping

Maximum consolidation of line items shipped to a single customer is achieved through use of a consolidation sorter and the computer-prepared consolidated



A stock picker completes picking and packaging an order, removes the lightweight handle from the cart and prepares to connect cart to the tow conveyor. The cart will travel to the dump station for input to the consolidation sorter and will return automatically to the stock picker's station.

picking lots. The consolidation sorter is the third high-speed tilting-tray sorter in the system. It can handle orders for 500 customers at one time. Issue Priority Groups 1 and 2 demands are released as required by MILSTRIP and routine Materiel Release Orders (MRO's) are released once each day. MRO's are then batched by the computer into consolidated picking lots. A number of single MRO's are added to each consolidated picking lot to comprise a master picking lot (MPL). Using this system, each MPL clears the sorter at a scheduled time to make room for the next lot.

Stock pickers use the conveyor carts to select stock from the storage bins as required on the MRO. Loaded carts are attached to the conveyor for movement to the packing area. The conveyor takes the carts to the packing area dump station for input to the consolidation sorter. Carts are automatically unloaded into the sorter and returned to the stock picker stations from which they originated.

At the rate of 60 packages per minute, the items are sorted to a packing line for single-item pack, a special pack line, or to one of the consolidation chutes for a single customer.

On the single-pack lines, items are circulated by powered conveyors past 72 packing stations. Packers

at each station take items from the line and pack them for shipment. Items not taken off the line are recirculated on the "square circle" conveyor until all items are packed and forwarded by conveyor to the shipping area.

Consolidated shipments are placed in cartons which pass down the conveyor to the dunnaging and sealing station and are moved automatically to the shipping area.

In the shipping area, containers move along a conveyor through an electronic weighing and cubing unit. This device automatically computes the weight and cube of each package as it moves along the conveyor belt. The unit then introduces this data into the computer for verification of shipping data and prints a shipping label. Items are then separated for shipment by truck, air, rail or parcel post.

Expanded Mechanization Foreseen

The total DSA mechanization program envisions installation of similar systems at all eight Defense depots. Systems are presently under contract for DSA's Memphis and Columbus depots, and these depots will utilize

(Continued on page 34)



NAVY PROCUREMENT PLANNING MOVES UPSTREAM*

Advance Procurement Planning may be defined as a series of decisions directed to the integration of procurement, technical, and financial plans during the weapon system (or commodity) acquisition cycle. The goal of Advance Procurement Planning is to obtain a successful weapon system, in a timely manner, at the lowest total cost to the Navy.

The Need For Advance Procurement Planning

The need for Advance Procurement Planning is based on the fact that many of the early acquisition decisions, made well in advance of the actual contracting evolution, have a direct bearing on the posture of the program as the Government enters the market to buy research and/or development effort and/or production. The industry-Government relationship is becoming more important than ever before. Hence it is essential that the Government do a better job of planning for the procurement of major weapons systems.

By RADM. J. L. HOWARD

Deputy Chief of Naval Material (Procurement)

*Adapted from a forthcoming Advance Procurement Planning Guide to be issued by the Chief of Naval Material.

The current defense/industry partnership began to take on a different character around the early years of the 20th century. The classical "three-bids, arms-length" relationship that existed (and still does) with the more common marketplace commodities bought by the Government, has had to be simulated by special techniques for those complex weapons systems in which the Government retains an intimate interest during the whole development, production, testing, and qualification cycle.

Ever since World War I, the U.S. Government gradually has been shifting away from in-house munitions capabilities and toward progressively greater reliance on private industry for the weapons of national defense. In the years between the world wars, this trend was almost imperceptible. Indeed, the military services continued to operate their shipyards, arsenals, ordnance plants, and research laboratories with the same vigor as in the previous century. In the mid-twenties, however, a number of new policies were formulated in the field of aeronautics that recognized the true role of private industry as an important element of national strength for defense. World War II (and, to a lesser extent, the Korean conflict) expanded this relationship, while the start of the cold war, with its demand for sophisticated weapon systems, provided the basis for the continued close relationship that exists between Government and industry today.

Even as aviation wrought new relationships between industry and Government, it also introduced new dimensions in the technology of weaponry. As aviation expanded into the realm of space, more and more scientific and engineering disciplines converged in the creation of the vehicles and weapons systems of the 20th century. It became the Government's role, therefore, to provide the necessary coordination of many contributing disciplines and to integrate these in creating new defense capabilities. Recognition of this need gave rise to the concept of project management.

The genesis of project management probably dates back to World War II and the Manhattan Project for the development of the first atomic bomb. But the real thrust and importance of the project management role derives from the major defense efforts of the early 1950's, which were characterized by the necessity for major technological breakthroughs along a broad front in programs of unprecedented dollar volume. It was recognized that industry had to be intimately involved in the defense effort to produce the needed weapons, but the technical complexity of the work and the diversification of research, development, and production disciplines involved made it essential that the Government supervise the total effort. The answer was project management, and the official recognition of a new executive: The project manager.

The crash weapon system programs that characterized the 1950's were, for the most part, successful in ac-

complishing their basic technical objectives. Many of these technical successes, however, were achieved at a high price. For example:

1. Some weapon systems were initiated and large sums were spent on their development, but these projects were never completed, because technology overtook them. Other systems were initiated and completed but delivered less-than-predicted technical capability.

2. Cost overruns were common, often as high as 300 percent or more.

3. Cost reimbursement contracts were placed with the majority of weapon system developers. These contracts often led to contractor inefficiencies and inequities, with less efficient contractors being rewarded on the same basis as highly efficient contractors.

4. Competition developed between Department of Defense (DoD) components for similar weapons systems. This competition resulted in duplication and in overlapping of capabilities at the expense of other equally important, although perhaps less glamorous, military obligations.

Defense budgets climbed substantially because of the dollar resources required to fund the sophisticated missile and weapon system being developed. And, once the needed military capability in advanced weapon systems had been achieved, it became clear that the magnitude of these efforts, when projected for future requirements, was such that the Nation's resources could be committed thereafter only on a selected cost/benefit basis.

In an environment of rapidly advancing technology where the promise of the future, in terms of hardware, was limitless, it was difficult to evaluate the relative merits of one "promise" versus another. With space capabilities becoming a reality in the 1950's, about the only measure of comparison between one program and another was the cost involved. In order to get in "on the ground floor" in a program that might provide a solid long-term production commitment, industrial concerns often "bought in" with overly optimistic promises of technical performance, because the only competition between firms was on a technical basis for the development work. Consequently, development work was almost totally concerned with demonstrating technical feasibility with little regard for producibility or ease of maintenance, or logistic support capability. Moreover, the expanded use of cost reimbursement contracts required the imposition of numerous cost and administrative controls to assure some protection for Government expenditures. Although these controls provided partial protection, they also interfered with normal management prerogatives and, to a certain extent, they disrupted traditional reliance on the competitive marketplace to provide protection through industrial efficiency.

Hindsight discloses that many of these, and similar, problems arose because of inadequate procurement planning by the Government. Clearly, the Government management structure has not always been equal to

the demands imposed upon it by these expanded needs. It is likewise clear that the magnitude of the sums being committed to any given effort underscores the urgent need for effective procurement planning.

In short, Advance Procurement Planning is required for many reasons: To insure that there is no undesirable overlapping of efforts in our defense programs; to insure that all essential operational, financial, technical, and procurement factors are considered in appropriate balance and in a time-frame that permits intelligent integration of procurement, technical, and financial plans during the acquisition cycle; and finally, to insure that the defense/industry relationship is implemented in a manner that provides optimum contractor motivation with minimum necessary Government management of the given program.

Development of Advance Procurement Planning

Advance Procurement Planning was first prescribed by the Secretary of the Navy in 1962. He directed that APP be performed for all procurements, but the requirement was expressed only in very general terms.

In 1964, the Secretary revised his instructions, to specify that APP would be required for negotiated hardware development and production procurements, as follows: (a) Development procurements estimated at \$300,000 or more for a fiscal year; (b) production procurements estimated at \$1 million or more for a fiscal year. The 1964 instruction also contained detailed procedures for the preparation of individual advance

procurement plans, and directed that these plans would be submitted to the Chief of Naval Material for approval prior to initiating any procurement action. The responsibility for performing APP was assigned to the head of the procuring activity (or the activity that initiated the requirement).

Notwithstanding this more definitive guidance, a study committee on Advance Procurement Planning in the Department of the Navy found in 1965 that the actual practice of APP left much to be desired.

The study report included the following significant finding:

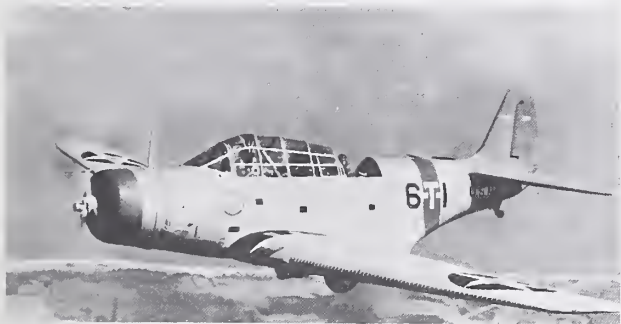
"The most striking fact about Advance Procurement Plans is that they are *not* prepared very much in advance of actual procurement action. Indeed, many are prepared after the Procurement Request is received, which is the time to procure, not the time to plan. Another striking fact is that not many plans cover items in the earlier stages of development. Instead, most plans cover items in current production, and, indeed, amount to little more than glorified requests for authority to negotiate."

As a result of this and other findings, the study committee submitted a number of recommendations, the most important of which called for:

1. Injecting procurement considerations at variable points during the early stages of the weapons system (commodity) acquisition planning cycle, and;
2. Shifting the responsibility for effective APP to the project or commodity manager.

"Typical World War II fighter aircraft weighed about 15,000 pounds—flew about 400 miles an hour—cost about \$65,000. Today's typical fighter aircraft weighs three times as much—flies four times as fast—costs 30 times as much. Avionics package alone today represents about 1/3 total cost."—Admiral I. J. Galantin, USN, Chief of Naval Material.

WORLD WAR II.



MODERN FIGHTER.



WORLD WAR I.



The committee recommendations were incorporated in a revised instruction issued by the Secretary of the Navy in March 1966.

General Requirements

The project manager, the project officer, the commodity manager or the program director (hereafter "project manager") is now responsible for Advance Procurement Planning and for preparation and approval of the advance procurement plan that documents his planning. This responsibility may not be delegated, although assistance in the planning function, and in preparation of the plan to reflect the planning that has been accomplished, is available from assigned procurement planners. Project managers must therefore be familiar with the procurement techniques and methods for accomplishing the project at the lowest total cost commensurate with the Navy's requirements. They must also be aware of general considerations such as competition, contract type, source selection, and so forth, that are a part of and affect each individual procurement action.

Familiarity with these matters, however, does not necessarily mean expertise. Although it is important that the project manager be able to recognize the conditions and/or problems that would suggest the use of one or more procurement techniques and methods, he need not be an expert on the requirements for their implementation. This expertise is available from the procurement planner (who is responsible for assisting the project manager by being knowledgeable in the details of implementation of procurement methods and techniques, and of DoD and Navy procurement regulations impacting on the project). Once the project manager has made the basic procurement planning decisions, actual preparation of the APP document is assignable to the procurement planner.

In general, Advance Procurement Planning must be initiated at the earliest practicable date. When new development requirements are foreseen, APP must be started concurrently with preparation of plans for the research and development phases (Technical Development Plans). If an individual item does not require preparation of a technical development plan, an advance procurement plan is required when it first appears in the Five Year Defense Program or in "shopping lists" supporting the budget request to Congress.

Each individual advance procurement plan contains a detailed analysis of procurement considerations applicable to the system or item to be developed or produced. Estimated costs and quantities planned for the next 5 years; background and procurement history; current and long-range procurement objectives, and techniques to be employed; availability of data for competitive procurement—these are but a few of the many points that must be covered.

Advance procurement plans must be as definitive

as possible. Of course, the degree of definitiveness normally reflects the stage of the procurement when the plan is prepared or updated. For example, plans prepared in the early development stages cannot be very specific about the use of techniques to be employed several years in the future when contracting for production. But they can be specific as to procurement methods to be used during the latter stages of development. As the time for production approaches, the updated plan will definitize on those techniques or methods appropriate for the production stage.

At a minimum, advance procurement plans must be updated annually at the time of the budget submission to Congress in January. The updated plan reflects the development or production progress during the past year and reviews the procurement situation in terms of such progress. To the extent necessitated by the events of the year, existing procurement objectives will be revised or new procurement objectives established that reflect a realistic appraisal of the conditions as they then exist or can be anticipated.

In addition to annual updating, advance procurement plans must be revised to reflect any change to the program proposed by the Chief of Naval Operations. Other substantive changes in the planned procurement, even though not the result of CNO-initiated proposed program changes, also require a revised plan. Such changes might include, for example, new circumstances or conditions that are expected to restrict planned competition or breakout.

Milestones

A critical part of every advance procurement plan is the milestone chart. The requirement for a milestone chart serves two important goals: First, preparation of the chart is a discipline that focuses attention on the time element required to achieve the proposed procurement objectives. For example, the use of Total Package Procurement necessitates significant preparation time—more than when development effort is procured separately from production. A properly prepared milestone chart will demonstrate whether use of this procurement technique is feasible from a time standpoint.

Secondly, the milestone chart benefits the users of the plan. For example, the contracts office will know when personnel resources must be available to commence a particular procurement action. As another example, the time when technical data must be available to permit a competitive procurement can be determined and planned for. The milestone chart, therefore, is very important and must be included and continually updated as an integral element of each advance procurement plan.

Key milestones may differ to some degree in each procurement, reflecting the particular circumstances

(Continued on page 38)



DEFENSE—INDUSTRY COST REDUCERS CHART FUTURE

—Term 1967 Workshop Series a Success—

Over 1,000 industry and Defense cost reducers participated in the 1967 series of Defense-Industry Joint Workshops on the Defense Contractor Cost Reduction Program.

Eight workshops in as many cities served to get working-level cost reduction personnel from industry and Defense together to discuss mutual problems and to develop recommendations.

There were three panel meetings at each one and one-half day session. These meetings explored in depth the specific areas of Value Engineering, Audit of Savings and the Program Guidelines. Actions on some panel recommendations have already been taken (see "Notes from the Director's Desk", p. 43) and others are in the mill.

At each workshop, participants were furnished questionnaires and asked to evaluate the meetings. Of those who responded, 90 percent stated they were worthwhile and should be held again on a recurring basis.

In a letter to the Defense Department, Daniel J. Haughton, Board Chairman of Lockheed Aircraft Corp., observed:

"We feel that the recent Defense-Industry Joint Regional Cost Reduction Workshops contributed significantly to even better working relations between DoD and the contractors, and to a more complete understanding of mutual problems and objectives."

The Cost Reduction Policy Directorate has published a comprehensive report on the workshops which has been distributed to attendees. The report contains:

- Recommendations of the panels and actions taken or underway;
- Industry and Defense presentations;

- Examples of contractor cost reduction actions displayed at Los Angeles.

In an introduction to the report, Paul R. Ignatius, Assistant Secretary of Defense (Installations and Logistics), who scheduled the series, states:

"It is apparent that this series of workshops has been productive and served its purpose. I believe there is no better way to resolve our joint problems than to meet face-to-face and discuss them in a candid, informal manner."

Consideration is being given to scheduling joint workshops annually.

(Photographs from the joint workshops appear on the next two pages.)



Maj. Gen. J. A. Goshorn, USA, Deputy Director of DSA for Contract Administration Services, receives copies of the workshops report from his secretary, Mrs. Thelma Baker.

EIGHT CITIES TALK

ST. LOUIS, MO.



The "brainstorming" approach was used at each of the eight Value Engineering Panel sessions. Attendees hurled ideas at the panel on "How to Increase the Effectiveness of the Value Engineering Program." Panel members then went into closed session to evaluate the ideas. The Panel Chairman reported results to the general assembly the second day of the workshops.

DALLAS, TEX.



Thomas H. E. Winshurst chaired the panel that critiqued the Contractor Program Guidelines. All eight panel sessions concluded that the Guidelines were working well for both industry and Defense. The Guidelines, which were developed jointly by the Office of the Secretary of Defense, major contractors and industry associations, were first published in May 1964.

SAN FRANCISCO, CALIF.

James M. Abbett, Cost Reduction Coordinator for the Lockheed Missiles and Space Company, was the industry speaker at the San Francisco Workshop. His subject was "Untapped Cost Reduction Opportunities." He observed: "The almost daily appearance on the scene of new products certainly offers a fertile field for opportunities in the area of cost reduction."



LOS ANGELES, CALIF.

Dr. G. Herbert True, research psychologist, was the luncheon speaker at the Los Angeles Workshop. His thought-provoking and entertaining topic was "Are You An Amateur or Pro and How Do You Know?" Dr. True characterized managerial reaction to frustrations by mentioning a book he planned to write, entitled: "Stance and Mental Attitude When Addressing the Fourth Putt."



COST REDUCTION (See page 27)

GARDEN CITY, N.Y.



Nearly 150 hardy cost reducers braved a heavy March storm on Long Island to attend the joint workshop at the Garden City Hotel. On hand to register them were four attractive employees from the host Naval Plant Representative's Office. Left to right, they are: Miss Nancy Hewitt, Mrs. Laureen McGarry, Mrs. Marilyn Pirone and Mrs. Barbara Martin.

BOSTON, MASS.



Colonel Frank A. Bogart, USA (right in photo), Director of Defense Contract Administration Services Region, Boston, acted as host at Boston. He was ably assisted by Daniel Grosser, his Deputy Chief for Plans and Management (left above). Lawrence Levy (center), President, Allied Research Associates, Inc., addressed the meeting on "Leadership Responsibilities in the Free World."

CHICAGO, ILL.

Chicago Workshop Audit Panel Members Ben T. Fukutome (left), Army Audit Agency, Howard G. Bowers (Chairman, center), Internal Audit Policy Division of the Office of the Secretary of Defense, and Norman Westall, Defense Contract Audit Agency, Cincinnati, take questions from those attending the panel. Eight major panel recommendations have already been acted on.



PHILADELPHIA, PA.

Rudy H. Kempter of the Directorate for Value Engineering in the Office of the Secretary of Defense chaired the VE Panels at the eight workshops. Panel recommendations and their disposition are contained in the Report of the 1967 Defense-Industry Joint Cost Reduction Workshops, which has been distributed to Workshop participants by "Host" DoD field activities.



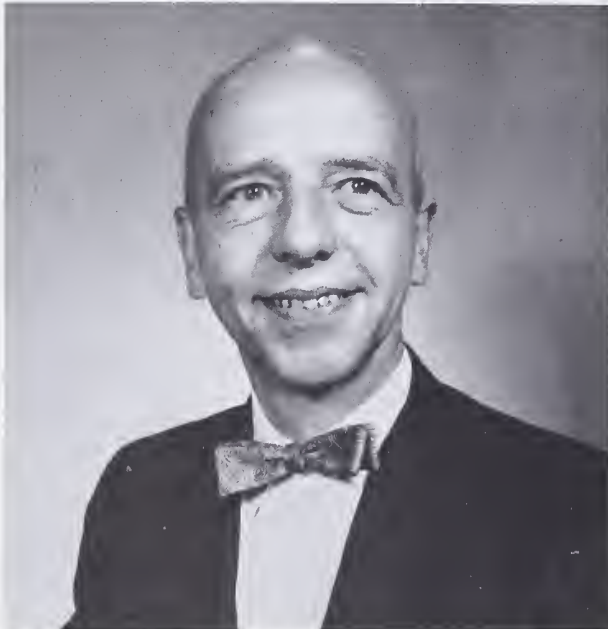
AUDITING THE COST

- **Why Audit?**
- **What Does the Auditor Look For?**
- **How Thorough Is the Look?**
- **Disputes—Who Settles Them?**

This Program Is Different

When the Department of Defense Cost Reduction Program was started in 1962, cost reducing systems were not new. Industry and most of the Defense Department components had been involved in cost reduction programs of some kind for many years before that. However, a big difference between the current program and others is that this one is broader and more systematically organized and managed than previous programs. Another big difference is that auditing of claimed savings was made an integral part of the Defense program. Later, many programs in industry

Co-author Kenneth K. Kilgore



adopted the validation feature to insure the credibility of reported savings.

Audit Is Independent of Program Management

From the start of the program, Secretary McNamara wanted the savings claims to be audited independently. In the early stages, he requested the Comptroller General to conduct the audit to provide an independent opinion outside the Defense Department framework. The Comptroller General considered it inappropriate for his office to assume the task and the audit job then was assigned to the Department of Defense internal audit organizations. One of the requirements of the assignment is that the same rigid standards of independence must prevail as are typical of all other audits made in the Department. The Secretary further gave the program a high priority so that audit resources would be assigned as necessary to evaluate savings claims at all levels. The audit of the program involves almost 200 man-years of audit effort annually which is indicative of the size of the program and the audit attention it receives.

The independence which the Secretary desired was obtained by forming two separate chains of responsibility. The segment which manages the program and reports its accomplishments is under the Assistant Secretary of Defense (Installations and Logistics). The validating function is under the direction of the Assistant Secretary of Defense (Comptroller). This separation of the management and validation functions exists in all levels of the Department.

Organization for Audit

The Assistant Secretary of Defense (Comptroller) provides policy guidance for the audit of the program.

REDUCTION PROGRAM

By K. K. KILGORE

and

FRANK ROMEO

*Deputy Comptroller for Audit Systems
Office of the Assistant Secretary of Defense
(Comptroller)*

Cost Reduction Program Audit Coordinator

Within his office, the Deputy Comptroller for Audit Systems monitors the overall audit performance and issues audit opinions on the consolidated DoD cost reduction reports. The Deputy Comptroller for Internal Audit conducts the audits of the Defense agencies (other than the Defense Supply Agency) and the unified commands.

Two of the staff of the Deputy Comptroller for Audit Systems spend full time on this audit. Their principal duties are to coordinate and direct the audits performed within the DoD components, and to audit the report consolidations prepared in the Office, Assistant Secretary of Defense (Installations and Logistics). A major part of the coordination function consists of following up on problems or queries which are referred by the Defense components.

The heads of the audit organizations of the military departments, the Defense Contract Audit Agency, and the Defense Supply Agency issue detailed guidance for audits performed by their respective organizations. Each agency has a full-time project officer or team at the headquarters' level, which directs and coordinates the audits within its component. Below the headquarters' level, key personnel have been assigned to direct the audit efforts of each field audit office. Also, specific individuals have been made responsible for the audit of the program at all major commands, departmental buying offices, and military activities.

There are some differences in the details of the audit instructions issued by the Defense audit offices. However, the overall approach to the audit is the same. Field auditors review savings claims at the level where the actions are taken. As these actions are forwarded through command reporting channels and included in report consolidations, the larger savings are desk reviewed by supervisors who also review the consolidated reports. Finally, the headquarters' project team reviews

the overall departmental consolidation. There have been a few complaints over the number of audit reviews. However, we think the reviews are needed to insure consistency in the auditors' interpretation of program criteria and audit guidance.

Objectives of the Audit

The chief objectives are to make sure that reported savings qualify under the rules of the Cost Reduction Program and that they are reasonable in amount. The audit is continuous so that audit opinions may be issued concurrently with quarterly Cost Reduction Reports published by each DoD component. Briefly

Co-author Frank Romeo



stated, the audit objectives may be summarized as follows:

1. To review and evaluate savings claims and cost reduction reports against the published criteria of the program.
2. To issue concurrent audit opinions on published Cost Reduction Reports.
3. To appraise the effectiveness of program implementation throughout the Defense Department.
4. To assist in achieving program objectives by identifying and suggesting new areas or functions for Cost Reduction Program emphasis.

The Audit Plan

The results of the program are widely publicized both within and outside of the Department. Therefore, it is essential that claimed savings be defensible; otherwise, the results could be embarrassing to the Department and its officials. To guard against such an event, only audited Cost Reduction Reports are submitted to the Secretary of Defense. Each report includes an Audit Opinion (much as Audit Opinions are included in the financial statements of private corporations).

Each year, many thousands of savings actions are proposed for reporting. These range from very small to very large savings. Like most other audits, the cost reduction audit is made on a selective basis. All large savings of more than a prescribed amount are audited in such detail as is necessary to confirm their eligibility and amount. A limited number of small savings, in dollar amounts of less than the prescribed threshold, also are audited in some detail. These savings actions are first desk-reviewed and those which clearly fail to meet the program's criteria are rejected. Of those which seem to qualify, a small number are picked for further audit examination and the others are accepted without further audit. If, however, the detailed audit of the selected savings shows faulty procedures or incorrect reporting, the size of the sample is increased. The foregoing audit scope takes in the bulk of the total dollar savings reported, and provides an adequate basis for attesting to the overall reliability of the cost reduction system and reasonableness of total savings reported.

The Point of View

The audit of cost reduction actions is, of necessity, quite different from the usual internal audits made in DoD. Although certain audit techniques are common to all audits, the audit objectives and the type and extent of supporting documentation available in the Cost Reduction Program are normally much different. Many judgmental considerations are involved, not only in determining whether a given action meets the criteria

of the program, but also in assessing the adequacy of supporting documentation. Obviously, it would not be desirable to insist on the preparation of new, extensive, and precise documentation and records only for cost reduction purposes. In reviewing savings, the auditors are instructed to consider the objectives of the program, to be objective in interpreting the criteria, and to be realistic in their requirements for supporting documentation. Where a saving obviously is the result of a conscious action that appears to support the objectives of the Cost Reduction Program, it generally will be accepted by the auditors even though it could be questioned on the basis of some technicality. However, if the calculation of the saving involves estimates, they are expected to be on the conservative side. On the other hand, the auditors also are charged with assuring that reported savings are supportable and will stand up under critical outside review. Therefore, if funds are "saved" by happenstance and cannot be shown to be the result of a new, improved or intensified management action, the savings claim will be rejected by the auditor.

DCAA Audits Contractors' Records

A great deal of coordination is required among the audit offices of the DoD components because of the interservice aspects of many of the savings actions. Where single managers are involved, or where one DoD component takes an action which produces savings for itself and another DoD component, the savings are reviewed by the office having audit cognizance of the activity which initiated the savings action. The results of the audit are then crossfed to the benefiting agency. Where savings are initiated in a Defense contractor's plant and it is necessary to review documentation maintained by Defense contractors, the Defense Contract Audit Agency performs the audit of the contractors' records. In such cases, DCAA's assist audit amounts to a factfinding service for the internal audit office. To the extent possible, however, we attempt to validate savings on the basis of documentation available within the Defense Department rather than to impose an additional review of contractors' records. Therefore, before requesting DCAA to examine savings claims, internal auditors will first attempt to validate the actions on the basis of such things as contract modifications, engineering change orders, contractors' approved pricing proposals, etc. Only when the data available in-house are inadequate is the Defense Contract Audit Agency requested to review a savings action.

How Disputes are Resolved

The very nature of the program has led to a number of honest differences of opinion as to whether certain



Howard Bowers (back to camera, left foreground), the OSD Supervisory Auditor, chairs a joint government-industry panel on audit problems in cost reduction at a regional workshop in St. Louis, Mo.

actions qualify for reporting under the criteria of the program. Therefore, a procedure has been developed for resolving differences where program monitors are convinced that a savings is valid but cannot get audit acceptance at their level. When this happens, the disputed action may be referred to each intervening echelon all the way up to the departmental Secretary or agency Director. Where differences cannot be resolved at the highest level of a DoD component, the cases are referred to the Office of the Secretary of Defense.

Other Audit Contributions

As indicated in the objectives of the audit, the auditor's role is not limited to the review of savings actions and cost reduction reports. In fact, we get greater satisfaction out of being able to make more positive contributions to the program. At all levels within DoD, the auditors cooperate very closely with program managers in reviewing proposed criteria and reporting procedures and thereby assist in developing improved program guidance.

In addition, regularly scheduled internal audits include a review of the effectiveness with which the audited activity is administering the program and audit reports include comments on any outstanding accomplishments or deficiencies noted. The auditors also take advantage of the broad range of subjects involved in their regular audits to try to identify new areas having cost reduction potential. Any such areas observed are pointed out to appropriate officials for followup.

Revision of the Cost Reduction System

The revised Cost Reduction Program, which is still in its early stages, undoubtedly will solve some old audit problems and introduce some new ones. The full impact of the system changes cannot yet be fully measured. One of the biggest audit problems will be eliminated because it no longer will be necessary to re-examine and revalidate old savings actions which were carried forward under the old system because they had recurring benefits. On the other hand, the auditor now has the problem of reviewing and validating estimates of savings expected to be realized in the budget and future budget years from the current year's management actions. This is required because the system now takes credit for the 3-year effect of savings actions which have recurring benefits. Whatever the impact will be on the audit, we know there will not be any diminution of audit emphasis of the program.

Audit Proves Out the Program

Probably no previous cost reduction program has received the audit emphasis—both in concept and operation—as has this one. There are no doubt cases in which reporters of savings and those responsible for meeting goals are disappointed when one of their savings is declared ineligible. However, based upon some 6 years' experience, there is no disagreement that a strong, independent audit is essential to the effectiveness and credibility of any cost reduction program. □

(Continued from p. 22)

the same basic pattern as Ogden to handle their workload. Programed for installation are selected applications of the system to DSA's depots in Tracy, Calif.; Mechanicsburg, Pa.; and Richmond, Va. Evaluations at Philadelphia and Dayton are currently in process. Facilities are programed for installation through 1969 with improvements not only in materials handling equipment but in the upgrading of warehousing throughout.

Mechanization of DSA's depot structure has been estimated to cost \$15 million. Annual savings are expected to amortize the investment at each location within 3 to 5 years.

The new cargo transporter for intra-depot use at DSA depots at Memphis, Tenn., and Tracy, Calif., can move 15,000 pounds on pallets or in bulk. Its conveyorized deck is 8 feet wide by 22 feet long. The deck can be raised or lowered to various loading platform heights. A single operator using controls in the cab (which swings to one side for loading and unloading) can move up to 75 tons of cargo in 1 hour. A smaller version of the cargo transporter is in use at Ogden Depot. Twenty transporters are on order for use at all DSA distribution depots.



Cargo Transporter in motion.



Cargo Transporter loading at dock, equipped with power conveyor.



Cargo Transporter loaded, backed out, ready to swing cab. Pallet restraint bar in place.



Cargo Transporter unloading onto gravity conveyor.

REDEYE VALUE ENGINEERING

By COLONEL G. D. MOBBS

*Director for Value Engineering, Office
of the Assistant Secretary of Defense
(Installations and Logistics)*



The author, at right, in company with Lt. Gen. A. W. Betts, Chief, Army Research and Development, and Mr. Paul V. Dobrow of the Army VE Division, examines the REDEYE system.

The REDEYE is a shoulder-fired air defense missile. It is designed for troop use to destroy low flying aircraft in the forward battle area. This unique little missile is completely self-contained. It will be used by an individual soldier. Its reaction capability is almost instantaneous. It requires no field maintenance. The REDEYE is often described as the world's smallest guided missile. However, the purpose of this article is not to discuss the size and characteristics of the missile but rather to report the results achieved from integrating value engineering into the REDEYE program management. The U.S. Army Missile Command is the REDEYE program manager. The REDEYE is being produced by the Pomona Division of the General Dynamics Corp. As the REDEYE record unfolds you will see that purposeful and continuing application of value engineering throughout the life of a program, can be rewarding to the contractor and to the DoD.

VE in REDEYE From the Beginning

Value engineering was used to develop cost targets for design engineers early in the life of the REDEYE program. Value engineers next worked with design engineers to aid in meeting the cost objectives. In late 1963 and early 1964, General Dynamics assigned value engineering teams to review the REDEYE program production proposal. Teams were formed from representatives of all major departments. Each team was assigned to particular segments of the proposal for a value engineering type examination. These teams elimi-

nated several million dollars of unnecessary cost before the proposal was submitted to the Army. A value engineering program requirement clause was first included in a fiscal year 1964 REDEYE research and development contract. The program requirement was continued in subsequent contracts and generated value engineering savings approximating \$4 million.

VE Incentives in Production Contracts

A comprehensive value control program was outlined by General Dynamics in the industrial program plan prior to contracting for the production program. Value engineering incentive clauses were incorporated in the fiscal year 1965 and fiscal year 1966 contracts. Under these value engineering incentive clauses the Army agrees to share savings with General Dynamics from Value Engineering Change Proposals (VECP's) proposed by General Dynamics and accepted by the Army. Sharing of savings on the instant contract, on follow-on procurement and for collateral savings, are features of these value engineering incentive clauses. By the end of 1967, almost \$5 million in estimated savings will have resulted from formal VECP's approved under the value engineering incentive clauses. This value engineering accomplishment is a substantial portion of the cost reduction savings of over \$12 million on the REDEYE program. The remainder is made up of contractor cost reductions in value control conservation, management analysis, and the employee suggestion program. These total program savings may be said

to not only represent costs which would have been borne had the cost reduction efforts not been made, but also tend to offset other costs associated with increasing weapon ruggedness and reliability.

Slightly over half of the \$5 million in estimated VECF savings on the REDEYE is on the instant contract with the remainder on follow-on contracts. In two current production contracts the Army's share of savings is 70 and 60 percent on the instant contract and 80 and 75 percent, respectively, on follow-on procurement. It is estimated that General Dynamics' (Pomona) share of these savings may be \$1½ million.

Examples of REDEYE VECFs

An example of a VECF that is achieving a significant saving involves the device that provides REDEYE impulse ignition at launch. Substantial unit cost reductions were obtained through the simplification of design, the reduction in the number of parts, the use of powdered metal parts and by the relaxation of tolerances. Total savings for the instant contract and follow-on procurement should be well over \$300,000.

Another noteworthy example is the battery-gas unit in which total instant contract and follow-on savings are estimated to exceed \$700,000. This item stores and releases the coolant for the IR detector. Reductions were achieved through the use of a simplified bottle design and a modified off-the-shelf release mechanism.

A third item concerns the infrared transparent dome on the nose of the REDEYE missile. The use of a lower cost, but entirely satisfactory material, permitted an estimated total cost reduction for current and follow-on contracts in excess of \$1 million.

These examples, plus 11 other approved VECF's (see fig. 1), provide the savings which are expected to reach \$5 million. All of these changes have been given technical approval by the Army and are being incorporated in the REDEYE weapon.

VE Incentives Extended to Suppliers

Standard value engineering incentive clauses have also been developed for use in outside procurement. In fiscal year 1967, REDEYE production program incentive provisions will be employed with at least 15 major suppliers.

As you might expect from the exemplary results achieved, Army personnel on the REDEYE program have been consistent supporters of value engineering. In addition to introducing value engineering contract provisions early in the program, Army personnel participated regularly in value engineering training seminars conducted by the contractor. Together, the Army and the contractor established a climate in which value engineering could thrive.

Value engineering began in the Pomona Division of General Dynamics in 1958. Its possible application

to the REDEYE program was discussed with an Army representative as early as 1959. A formal value control program with coordinators assigned in each major department was established in January 1960. By September 1963, all cost reduction program elements were placed under a single Director of Cost and Value Control. The responsibilities of the department coordinators were expanded to encompass all elements of the cost reduction program. The Pomona Division's cost and value control program is fully formalized and authenticated by management in widely distributed internal directives.

Both the Army and General Dynamics intend to place continuing heavy emphasis on cost effectiveness in the REDEYE weapon system. Value engineering activity, including further mutually advantageous use of incentive clauses, will continue to be a key element in the overall cost reduction effort for REDEYE.

What are Your VECF Results?

In fiscal year 1966, 979 VECF's submitted by defense contractors were approved with estimated savings of \$36 million. Of the 979 approved VECF's, 125 were high dollar (estimated savings of \$50,000 or more before sharing). These were submitted by 28 defense contractors. Figure 1 shows that the Army REDEYE program and the Pomona Division of General Dynamics were frontrunners. If the results were as good on the total fiscal year 1966 DoD program authorization for centrally procured systems and equipment as on the REDEYE, the value engineering cost reduction from contractor-initiated VECF's in fiscal year 1966 would have been about 25 times greater than the \$36 million reported. □

REDEYE VECF's AND ESTIMATED SAVINGS*

	Instant contract	Total
Impulse generator.....	\$21,500	\$388,100
Detector cryostat.....	300,000	951,500
Refrigerant bottle.....	489,300	775,200
Dome housing.....	692,600	1,015,400
Torque motor pot.....	179,700	353,300
Umbilical connector, gyro activator.....	317,600	441,600
Network battery bulkhead...	119,900	175,700
RFI shield.....	239,000	341,200
Open sight.....	111,000	250,300
Reticle assembly.....	69,500	111,900
Damper assembly.....	18,300	53,800
Electronic control assembly..	1,600	12,800
Electronic control-launcher ..	31,600	67,500
Test equipment kit-thermocouple.....	28,800	28,800
	2,620,400	4,931,100

* Subject to final audit.

Figure 1



PRODUCTIVITY—What is Par for the Course?

By **HARRY HANNA**

*Management Analyst
Office of the Navy Comptroller*

Setting the Handicap

In 1963, a study was undertaken to improve the work measurement program of Navy's financial services. The structure of the then existing program was found to permit only an analysis of group performance since the concept detailed only major functional work areas within an activity and related all corresponding personnel (supervisory, direct productive and indirect support) hours expended to the applicable function and its work unit indicator (i.e., dealers' bills, travel claims, pay records). The resulting group production rate (work units completed ÷ man-hours expended) developed only a "did take" standard without considering what the "should take" level was. This is like playing a golf course without knowing what par is. Navy had been playing this course for many years and had improved steadily. Was it now shooting par? Many key personnel thought so and most felt they were in the fairway, but yet none really knew what an average shooting score should be.

The Links

The NCFS (Navy Directorate of Financial Services) field system is composed of 20 activities, 17 of which are situated in CONUS, one in Pearl Harbor, Hawaii, and one each in Guam and Yokosuka, Japan. Structured in a regional, pyramidal grid pattern, the system consists of the following number and types of activities: 11 Navy Finance Offices (NFO's), seven Naval Regional Finance Centers (NRFC's), and two Navy Finance Centers (NFC's).

The finance activities are located at major Navy complexes to provide various disbursing, accounting and related finance support functions. Briefly, the NFO's furnish local disbursing support to numerous shore activities and operating units of the fleet. The NRFC's serve a dual purpose of providing both local support and regional accounting, examination, and reporting functions, while the NFC's perform centralized Navy-wide functions (NFC Cleveland for pro-

grams primarily related to military pay, NFC Washington for accounting and certain specialized programs). The system in its entirety is manned by 3,150 civilians and 450 military personnel.

Keeping Score

To be able to perform a mission in an effective manner, it is generally accepted that you must know what you are doing, how efficiently it is being done, and how well actual operations measure up to planned levels. Regardless of the type of operations performed, this basic management information, in one form or another, is indispensable to those who control resources—as long as efficiency and quality are primary criteria for the organization's existence.

In recent years, the Department of Defense has placed more and more emphasis on the monitoring of progress against goals through quantitative means. The concept of cost effectiveness, the development of PERT, the use of Industrial Fund Accounting and the impending implementation of the Resources Management Systems all consider the essentiality of relating resources to planned input and through work progress and reporting systems, analyzing the effectiveness of actual to planned and, where necessary, taking any alternative approach that may be required to improve performance.

Practice Tee

The growth of productivity measurement within the Department of Defense has been received best by those resource managers and employees who have experienced such systems and recognize them as valuable aids to management.

To improve certain aspects of the Navy's financial services measurement program, the programs of others were studied. Finally, the Methods Engineering Program (MEP) pioneered by the former Bureau of Supplies and Accounts was chosen. This program has as its base a detailed analysis of all tasks performed by individuals with resultant "standards" being established by the following precise, engineered means: Standard data, time study, methods-time measurement, and work sampling. Summarization of data is then obtained for performance at the group or component level. With the introduction of MEP as a buttress to work measurement, the infrastructure of our productivity measurement system has been solidified. Performance of indi-

viduals and groups can be compiled and related against the engineered standards established for "average" personnel.

Between September 1963 and February 1965, eight MEP teams totaling 27 personnel were introduced in our largest activities. This new program was accepted by all activity commands with, however, some skepticism about its potential results. With good training provided by experienced BUSANDA personnel, analysts proceeded ahead and soon dispelled doubts concerning the program's worth. Unearthed in the initial stages, through the penetrating and detailed analysis and measurement stages of each survey, were significant methods improvements and evidence of subtle but excessive personal and idle time—too subtle to be noticed by supervision or even by the employees themselves, but easily distinguished through work sampling study.

Birdies and Bogies

The results to date have been impressive. A total of 1,031 incumbered positions have come under MEP standards resulting from 49 original surveys. Of this number, 107 incumbered positions were eliminated, representing a realized savings of 10.4 percent. Subsequent to the original studies, and as an essential part of the total program, 24 maintenance reviews of surveyed components have been undertaken. These reviews have resulted in 23 positions being reestablished. The additions are as a result of a heavy work input generated by the ever increasing tempo of Navy operations required to support activity in WESTPAC and inevitable during dynamic periods of growth. Net effective savings to date are, therefore, 84 of 1,031 positions or 8.1 percent.

This represents a *real* annual savings of approximately \$409,000. Annual cost to support 27 MEP analysts is placed at \$208,000; thus, the current "pay-off" is \$1.97 for every \$1 spent.

The Heart of the Game

While these management tools have proven of great value in elevating efficiency and conserving resources, the largest share of the credit for their successful application in the finance activities must be given to the people who comprise these organizations. There is full recognition among both the military and civilian personnel that the mission they are performing is to provide essential support to the operating forces of the Navy, and they take great pride in giving the best possible service to their customers. Many of them are long tenured, who came into the organization, liked it, and stayed on despite difficult and sustained work pressures. What motivates them? Perhaps the answer is that esprit de corps is not necessarily limited to organizations possessing battle flags and campaign streamers. It can be found anywhere there exists a common spirit striving to attain common goals in unison. □

PROCUREMENT PLANNING—

(Continued from page 26)

or conditions of that procurement. The critical milestones of each program *that affect the procurement actions* require identification and inclusion in the plan. For example, if one procurement action depends upon the timely completion of another procurement, or the availability of Government-furnished property, these factors must be a part of the milestone chart. If the dates are not met as scheduled, the plan must be revised promptly to reflect the impact of the delay on the stated procurement objectives. Other examples of major milestones and decision points are:

- Completion of research, development, test, and evaluation;
- Review of design to assure maximum standardization, producibility, operability, maintainability, and reliability;
- Receipt of prototype or initial production;
- Availability of technical data to facilitate competition in the procurement of either the basic equipment or components thereof;
- Introduction of more advanced types of contracts designed to provide optimum contractual incentives related to performance, delivery, and cost;
- Competitive subcontracting and breakout plans, including a schedule for review of proprietary items incorporated in the design to determine whether standard items or items already in the supply system can be substituted that will provide adequate performance characteristics consistent with other design requirements;
- The earliest point at which it is *practicable* to introduce competition without compromise to the system's performance, safety, and reliability, or required delivery dates.

Summary

It is readily apparent that the Navy's Advance Procurement Planning procedures are founded on the basic premise that such planning can be effectively employed only when done on a systematic basis far in advance of the contracting stage.

Furthermore, it is an integral part of the overall planning effort that must precede and guide the successful acquisition of any major weapon system or equipment. Therefore, the project manager or commodity manager—the man responsible for the acquisition program—must actively assume the dominant role in the Advance Procurement Planning process.

Used in this manner, Advance Procurement Planning becomes a valuable tool by creating early visibility of potential procurement problems, by providing a means for solving them, and by making it possible to acquire the weapons of defense in a timely manner at the lowest reasonable cost. □

CONSERVATION AWARD FOR FORT RUCKER

Fort Rucker, Ala., has been selected from among six nominated military installations as winner of the 1966 Secretary of Defense Conservation Award.

Runners up for the 1966 Award are the Marine Corps Schools, Quantico, Va., and the Naval Auxiliary Air Station, Meridian, Miss.

The final selections were made following a 4-day on-the-scene inspection tour of the nominated bases in Alabama, Mississippi, New Hampshire, Pennsylvania, Tennessee, and Virginia. This is the first year that the selection committee has made an on-the-scene inspection of the finalists, which was completed in May 1967 after covering 2,400 miles and reviewing natural resources programs on 200,000 acres of land and water at the military installations visited.

The Conservation Award, established by Secretary of Defense Robert S. McNamara in 1962, is the highest honor given to a military installation for the management of its natural resources programs. There were 70 installations in the original competition, from which the six finalists were nominated and judged.

Members of the selection committee who made the survey trip were: William H. Point, Director for Real Property Management, Office of the Assistant Secretary of Defense for Installations and Logistics, Chairman; John A. Baker, Assistant Secretary of Agriculture; Stanley A. Cain, Assistant Secretary of the Interior; Dr. Ira N. Gabrielson, President, Wildlife Management Institute; Joseph W. Penfold, Conservation Director, Izaak Walton League of America; Chester F. Phelps, Executive Director, Virginia Commission of Game and Inland Fisheries; and Lt. Col. Russell E. DeGroat, USAF, Staff Director of Natural Resources, Department of Defense, Executive Secretary.

Fort Rucker, Ala., is the home of the U.S. Army Aviation School, comprising 60,000 acres with a total of 26,700 military and civilian personnel.

CAPEHART MERGER SAVES AIR FORCE \$335,000

Under the Capehart-Rains Housing Program the Air Force has constructed over 60,000 family housing units for military personnel at a cost in excess of \$1 billion.

The contracting procedures, in brief, required the successful bidder to form a corporation or corporations which leased on-base land from the Government and arranged with a financial institution to finance the project by a 100 percent mortgage. This mortgage was then insured by the Federal Housing Administration.

Upon completion of the project and after payment of the mortgage proceeds to the contractor, the stock of the corporation was transferred to the Air Force and the loan amortized through moneys appropriated for payment of housing allowances for personnel assigned quarters in the project.

To reduce the administrative burden of maintaining the separate identities of almost 500 such corporations, they were merged into one entity, the U.S. Air Force Housing, Inc. Savings to the Government in fees, taxes, and other costs will approximate \$335,000.

DIPEC RE-USE DATA SHOWS GAIN

Reutilization of Defense-owned industrial plant equipment is running well ahead of the same period last year, according to figures reported by the Defense Industrial Plant Equipment Center (DIPEC), at Memphis, Tenn.

DIPEC, a major activity of the Defense Supply Agency, is charged with assuring proper reutilization of such equipment, owned by the military departments, in order to offset new procurement.

As of March 1, DIPEC has posted data to show that 8,106 items, valued at \$100,429,978, had been reutilized. During the same period last year, DIPEC reported reutilization of 6,624 items, valued at \$18,219,225.

Here are some typical reuse applications.

- DIPEC received a request for the Naval Ship Repair Facility at Guam for a boring, drilling, and milling machine. A suitable item was located at Defense Depot Mechanicsburg, Pa., and shipment of the equipment, which originally cost \$164,105, was expedited by DIPEC.
- The Air Force requested a boring and turning machine to be used by one of its contractors on the Thor program. A machine to fit the requirement was located idle at the Schenectady, N.Y., Army Depot. DIPEC immediately arranged to ship the equipment to the contractor. Acquisition cost of the item had been \$138,938.
- Another request came from a firm in Westburg, Long Island, N.Y. This was for a milling machine to be used in connection with an aircraft production program. A suitable item was located at Mechanicsburg. The milling machine had originally cost \$110,999.

There remains a great potential for further reductions—in improved computation of requirements, use of excess inventories, avoidance of goldplating, and in many other phases of our operations—

General FRANK S. BESSON, Jr.

*Commanding General,
U.S. Army Materiel Command.*



MILITARY IDEAS HELP CIVIL BUDGETS

The direct pump-out dredge COMBER is shown alongside a mooring barge which serves as the terminal end of the pipeline. In this position the COMBER uses its own power to pump the dredged material to a designated discharge basin.

Army Builds Civil Works

Those relaxed types who track progress as the construction industry rearranges the skylines of our towns and cities are called "sidewalk superintendents." There is a related breed of knot-hole kibitzer who confines his curiosity to marine or shoreline activities, like the construction of bridges, clearing of harbors, dredging of rivers, and building of causeways or dikes. Call him "Mr. Waterfront Watcher."

He can ogle a wide variety of interesting activities. In addition to the marine work being done by commercial firms, the Army Corps of Engineers is always busily engaged in pursuing a diversity of civil works projects.

Since 1804

Some may wonder why the Army is engaged in such enterprises. The answer is that the U.S. Corps of Engineers is unique among the military engineering organizations in the world in that it has both military and civil functions. Ever since the Corps was established by President Thomas Jefferson in 1804, it has been assigned civil works missions for the protection of the American people and the advancement of the economy. Its accomplishments are many and some have lasting historical significance. It was the Army Engineers that finished the Washington Monument after the civilian contractor gave it up as an impossible job. Chalk up to their credit also: The dome of the U.S.

Capitol, the Library of Congress, the Panama Canal, and more recently the U.S. part of the St. Lawrence Seaway.

The Corps also maintains the Nation's navigable waterways and harbors, and constructs causeways and dikes to prevent flood destruction of life and property.

Low-Cost Dredging

One very important behind-the-scenes fact may escape the casual taxpaying onlooker as he watches the Engineers carry out their civil works assignments. The Corps saves him millions of tax dollars in the way in which it gets the jobs done.

Just suppose that Mr. Waterfront Watcher paused along the lower Delaware River as the Engineers removed thousands of tons of shoal material to clear the river for navigable traffic. For years several tried and true methods were applied to this work, including: The pipeline dredging method where the material is forced through pipelines to preselected discharge points; the bottom-dumping method which involves loading the material into hopper barges where it is towed to deep water for bottom dumping; or the sump rehandling method which requires the unloading of the material into a separate rehandling barge from which the sump is then pumped ashore. All of these methods work, but some are expensive, others require procurement of new equipment, and still others are inefficient.

Today, the Engineers use a new dredging system



Photo shows the sidecasting dredge MERRITT in operation clearing entrance channels through reefs and bar shoals along the Atlantic Coast. This dredge was converted from a surplus Navy craft in lieu of procuring a new vessel costing \$300,000.

called "Direct Pump-Out." With this system, the hopper dredges tie up to a mooring barge containing the terminal end of a pipeline, and by use of their own motors pump the effluent, or dredged material, to the discharge basin. Instead of buying new equipment to do this work the Corps, through exercise of its traditional "engineer ingenuity," found a way to convert existing equipment. The savings to the taxpayer on this part of the exercise amounted to a whopping \$4,506,805. With the converted equipment they were able to dredge and move the material ashore at a cost of only \$0.296 per cubic yard for a saving of \$0.059 per cubic yard over the old methods. With about six million yards dredged so far, the savings amount to \$354,000.

Good Use of Excess

Now let's take Mr. Waterfront Watcher to any one of the numerous navigation projects along the Atlantic and Gulf coasts where entrance channels for ocean-going vessels are being cleared through reefs or bar shoals. The problem here was that the Corps' seaworthy dredging barges were too large to assure adequate flotation except at the high stage of tide. The obvious solution would be to acquire new equipment to do the job. Instead, the Engineers searched Government excess property lists and found that the Navy had two surplus watercraft that could be transferred without reimbursement. The two craft were converted into

side-casting dredges at a cost of \$800,000 less than the cost of buying new dredges.

There are many other instances of substantial savings to the taxpayer in carrying out the civil works responsibilities of the Chief of Engineers. Over \$2,700,000 was saved in new procurement costs by utilizing nine additional Navy surplus hulls for conversion to patrol boats, drift collectors, derrick-boats and snag-boats. In addition, 10 steel hull, 65-foot diesel powered T-boats were obtained without charge from the Army Materiel Command for use as ocean survey boats and hopper dredge tenders. These boats cost \$150,000 each when purchased new. Also, two J-boats (45-foot hull) were obtained for use as patrol boats at a saving of \$120,000; plus two crane barges valued at \$2,000,000.

DoD Not Credited

In addition to dredging up sump to clear the way for improved navigation, etc., the Corps of Engineers at the same time, has been digging up additional savings for the taxpayer to the tune of \$10,980,800.

For the record, civil works savings are not reported under the Defense Cost Reduction Program since the savings have no effect on the Defense budget. The Corps of Engineers' civil works savings are reported separately to the President and Congress as an additional part of the Government-wide cost reduction effort. □

ASO HONOR ROLL



Two employees of the Navy's Aviation Supply Office's (Philadelphia, Pa.) Technical Division, Ben Natale (left) and Charles Thompson (right) watch as Capt. B. M. Cates, USN, Technical Division Director, adds their names to the division's DoD Cost Reduction Program Roll of Honor. Natale and Thompson earned placement on the honor roll for their recent cost reduction of \$298,422.

They questioned whether a Supervisory/Regulator Panel adequately checked out certain support items. A Value Engineering study developed the fact that the equipment was designed principally for troubleshooting—not for thorough operational checkouts.

Further study revealed that existing common study equipment already available at Naval aviation activities would better accomplish the functions of the special test equipment. In addition, these common test sets would more completely analyze the problems and give a more meaningful approach to the resolution of the malfunction(s) present.

The Aviation Supply office obtained approval for the use of the standard test equipment. Accordingly, the requirement for the questioned items was canceled, resulting in the saving.

BATTENED BUCKETS BRING BUCKS

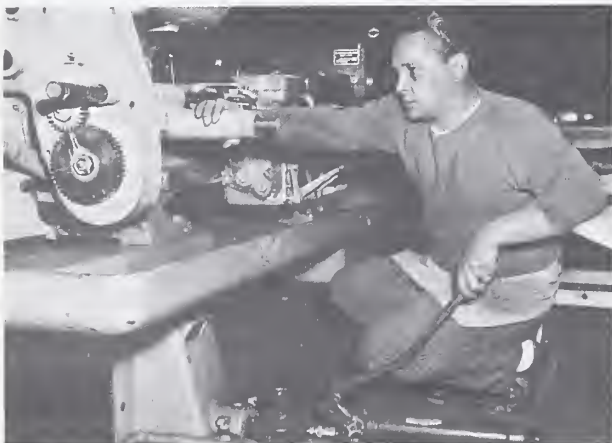
The Air Force's Arnold Engineering Development Center, Tenn., has been having problems by the bucket-full with its steam generating plant. It seems that the plant has two vertical conveyors for moving coal from the yard into the plant and thence to the furnaces. A conveyor consists of a number of buckets attached to an endless belt. These buckets take quite a beating. Most of the strain is on the back of the bucket which frequently becomes so bowed that the entire bucket has to be replaced by a new one to prevent fouling the conveyor system.

This constant maintenance problem became such a headache that two machinists, V. P. Hamilton and J. P. Wyatt were asked to take a crack at finding a solution. Working together, the two designed a steel batten that when bolted against the back wall, strengthens the bucket and prevents bending or warping.

So far this year 173 buckets have been rescued from the junkpile for savings of \$3,600. The photo shows machinists Hamilton, left, and Wyatt, holding bucket and batten. ARO, Inc., is operating contractor of the Center.

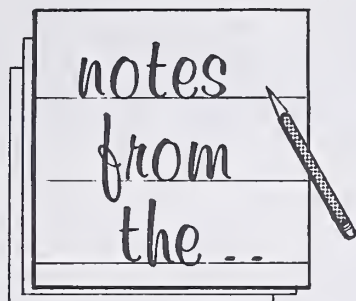


JACK THE GIANT-LIFTER



James Liegl, machinist at the Defense Supply Agency's depot in Tracy, Calif., uses a hydraulic jack leveling device which earned him \$90 in the depot Suggestion Awards Program.

Liegl, who is employed in the Tracy Depot's Industrial Plant Equipment Operations Facility, tired of leveling heavy equipment by means of leveling pads and wrench, so he developed this hydraulic jack device which permits one man to do a job which formerly took two men from 1 to 3 hours to accomplish. The device, which is expected to result in an annual saving of more than \$1,700 a year, can also be used on such other jobs as positioning large boxes, machinery, electric motors and similar tasks which now require the use of an overhead crane and riggers.



director's desk



Readers with a yen for more nuts-and-bolts knowhow in cost reduction management have asked the JOURNAL to regularly feature informal comment on new developments, guidance and instructions. The JOURNAL is happy to oblige. The following notes were provided by Harrell B. Altizer, Director for Cost Reduction Policy, Office of the Assistant Secretary of Defense (Installations and Logistics).

***The Importance of Reporting Savings When They Occur**

Over the past 5 years it has been somewhat distressing to observe—year after year—that very few new cost reduction actions are reported in the first quarter of the fiscal year. Gradually in the second and third quarters the tempo of reporting increases. Finally in the fourth quarter, in an effort to meet goals and to pick up valid actions not reported in previous quarters, reporting reaches avalanche proportions. This last minute reporting frenzy creates a burden on everyone associated with the program and makes it virtually impossible to determine during the first 9 months of the year the true status of the program. This undesirable situation can be avoided by documenting and submitting cost reduction actions to the local monitor concerned as they occur. All Cost Reduction Program monitors or coordinators should be alert to this situation and do what is necessary to assure that actions are reported to them on a timely basis.

***Publication of Fiscal Year 1968 Guidance**

The issuance of DoD Instruction 7720.6, "Department of Defense Cost Reduction Program—Reporting System," dated May 19, 1967 undoubtedly represents a key milestone for all true-blue cost reduction types. This instruction embodies the recommendations of many dedicated cost reduction personnel within the military departments, the Defense agencies and the Office of the Secretary of Defense. Of particular importance was the contribution made by our 25 subgroups, one for each area of the program, composed of representatives of the military departments, appropriate Defense agencies, and chaired by a representative of the Office of the Secretary of Defense (Installations and Logistics). These subgroups served as the technical advisors for their areas of the program and recom-

mended the special guidance contained in Inclosure 2 of the instruction. The guidance issued in May represents a comprehensive body of criteria developed from hundreds of recommendations made by a countless number of experts on cost reduction. I believe you will find that many problems of the past can now be resolved without undue discussion and frustration.

***Time Saved Must Be Well Spent**

Many questions have been asked concerning the propriety of reporting cost reduction savings resulting from actions which reduce the time required to perform a job, operation, function or activity. Although time saved can be a factor in determining the total value of a cost reduction action, savings should never be based or supported upon time saved *per se*. Instead, savings must be determined by comparing the cost which was being incurred "before" the action was taken with the cost which is or is expected to be incurred "after" the action is taken. Both the "before" and "after" costs must be supportable from existing records maintained by the reporting activity.

***Joint DoD-Industry Cost Reduction Workshop**

In April a series of eight joint DoD-Industry Cost Reduction Workshops was completed. Total attendance exceeded 1,000 Defense/Industry personnel. The workshops directly contributed to three basic decisions which were incorporated in DoD Instruction 7720.6 (see Publication of Fiscal Year 1968 Guidance, above). These are:

—A decision to use three standard DD forms to report all the data required in the Cost Reduction Program, thereby replacing the eight forms and formats used during the interim period, fiscal year 1967. The use of these forms is mandatory at all levels within the DoD.



director's desk

- A decision to discontinue reporting savings from Class II value engineering change proposals in the DoD Cost Reduction Program (except for savings resulting directly from a contractor value engineering program funded as a separate line item in a contract).
- A decision to place the responsibility on the appropriate contracting (buying) activities of each DoD component for identifying and reporting qualifying savings on contracts.

We believe these decisions will simplify overall reporting, place the responsibility for reporting valid savings on Defense contracts at the level where the

action is approved and improve DoD/Contractor relationships.

****International Balance of Payments (IBP)***

A new feature of the Cost Reduction Program Reporting System, commencing in fiscal year 1968, is the requirement to separately identify those cost reduction actions which also have a favorable impact on IBP. Due to the national importance of the IBP program, all cost reduction monitors and coordinators, particularly those in overseas locations, are urged to be aware of this new requirement and make every effort to properly identify cost reduction actions which also affect this key program.

VALUE ENGINEERING—PROMISE AND PAYOFF

For 3 years the Department of Defense has been sending Value Engineering teams to industry to stimulate greater interest in finding ways to produce better items at less cost. These promotion teams demonstrate how second thoughts about design and production can be turned into cold cash in the form of increased profits for the contractor as well as significant savings for the Government.

Value Engineering incentive clauses have been written into many contracts. These clauses encourage the contractors to exercise ingenuity in meeting the buyer's needs and thereby obtain up to 50 percent of any money saved as a result of VE design or production changes that lower product costs. As an added incentive, the clauses may permit the contractor to share in royalties on these changes for 1 to 3 years even if he does not get the follow-on contracts.

The Navy Aviation Supply Office, Philadelphia, Pa., has been making a special effort to encourage contractors in their VE efforts and has had some happy results. Here are a couple of recent examples:

- By changing a film spool from aluminum to plastic,

a Navy contractor was able to reduce the total cost of his product by \$65,000. His bonus over his regular profit was \$32,500. The Government's total cost was reduced by the other half of the saving.

- In another 50-50 split arrangement, a helicopter manufacturer reduced the cost of two of his components. An improved production method lowered the cost of control boxes; a substitution of nonradioactive uranium in place of tungsten brought down the cost of trim weights used to balance the rotor blades. The share-and-share-alike arrangement gave the contractor \$6,000 for the control box change and \$900 for the uranium idea and reduced the Government's cost by a like amount.

Experience has shown that once a contractor has tapped the VE lode he usually becomes a repeater. The VE promotion teams in their visits to industry and the contractors who already had aggressive VE staffs have proved that extra profits can be made. The results are encouraging more and more Government contractors to get on the VE bandwagon.

THE WHITE HOUSE

Executive Order

ESTABLISHING THE PRESIDENT'S ADVISORY COUNCIL ON COST REDUCTION

WHEREAS the economical management of the executive branch is a vital and continuing responsibility of the President; and

WHEREAS it is essential that the resources devoted to the fulfillment of our international responsibilities and the needs of our citizens be utilized in as effective and prudent a manner as possible; and

WHEREAS economies achieved in any governmental program permit more effective meeting of these urgent national needs; and

WHEREAS the best cost reduction practices and techniques developed by individual Government agencies and by business and industry should be utilized in all Government agencies whenever applicable; and

WHEREAS there is a need for review and advice to the President on the progress of the Government's cost reduction program:

NOW THEREFORE, by virtue of the authority vested in me as President of the United States, it is ordered as follows:

Section 1. *Establishment of the Council.*—(a) There is hereby established the President's Advisory Council on Cost Reduction (hereinafter referred to as the Council).

(b) The Council shall consist of the following:

(1) The Director of the Bureau of the Budget, who shall be the Chairman of the Council,

(2) The Secretary of Defense, the Chairman of the United States Civil Service Commission, and the Administrator of General Services,

(3) Such other heads of executive departments and agencies, and such other officers or employees of the Federal Government, as the President may designate, and

(4) Such other members as the President may appoint from the public at large.

(c) Federal members of the Council shall receive no additional compensation for such service. Members appointed from private life shall receive compensation for each day engaged on business of the Council and travel expenses, including per diem in lieu of subsistence, as authorized by sections 3109 and 5703 of Title 5 of the United States Code for persons in the Government service employed intermittently.

Sec. 2. *Functions of the Council.*—The Council shall:

(1) Review and evaluate the nature and adequacy of the Government cost reduction efforts and advise the President on means to strengthen and improve them.

(2) Explore with responsible operating officials throughout the executive branch opportunities for cost reduction and appropriate actions to achieve them.

(3) Consult with leaders in business, industry, and research to draw on their experience in achieving cost reductions and to invite their suggestions.

(4) Identify outstanding cost reduction programs, practices, and techniques developed for Government agencies and in business and industry susceptible to wider use in Government.

(5) Submit a final report to the President containing an evaluation of the Government-wide cost reduction program and appropriate recommendations for enhancing its effectiveness no later than 12 months after the effective date of this order, and make interim reports which it deems advisable.

Sec. 3. *Federal agencies.*—(a) Upon request of the Chairman, each executive department and agency shall, consistent with law, furnish the Council available information which the Council may require in performance of its functions.

(b) Each executive department and agency represented on the Council shall furnish such necessary assistance to the Council as may be authorized by section 214 of the Act of May 3, 1945, 59 Stat. 134 (31 U.S.C. 691).

Sec. 4. *Termination of the Council.* The Council shall terminate 30 days after the submission of the final report to the President.

THE WHITE HOUSE,
May 23, 1967.

LYNDON B. JOHNSON.

SEPTEMBER VE CONFERENCE SET

Paul R. Ignatius, Assistant Secretary of Defense for Installations and Logistics, will keynote this year's DoD In-House Value Engineering Conference scheduled for September 12-14 at the Willard Hotel in Washington, D.C.

DoD activities will be represented by over 300 selected middle management personnel involved in contracting, auditing, program/project management, procurement, engineering, logistic support and value engineering. Technical presentations will support the conference theme: "The Role of Value Engineering in Support of Defense Management Objectives."

LTGEN Austin W. Betts, Army Chief of Research and Development, will present the opening day welcoming address on September 12, 1967, as Department of Army host of this year's Conference.

SECOND LOOKS COUNT BIG

A metal that corrodes too quickly; a package that doesn't protect; a pilot's helmet that looks like it might have to be scrapped; an overly expensive control valve—these are the problems tackled and solved by Value Engineers at the Navy Aviation Supply Office, Philadelphia, Pa. Navy hired these VE experts to see that it gets top value for every dollar it spends. Savings of \$6.5 million last year prove that these engineers are doing their job well.

- The largest single VE saving exceeded \$3.7 million. It resulted from halting the premature disposal of life rafts based on out-dated deterioration-in-storage standards.
- Reworking pilots' helmets instead of buying new ones saved the Navy \$550,000.
- Purchase of missile launcher control valves costing \$400 each was canceled when VE studies revealed that a similar valve costing only \$64.25 each would

perform just as efficiently.

- A shortage of oil coolers was erased when tests proved that excess oil coolers bought for another purpose could be used satisfactorily. This discovery saved \$170,000 in new procurement funds.

- Value engineering led to a \$39,000 saving by eliminating unnecessary antireflective coating on lenses.

Last year the Aviation Supply Office had 145 VE projects going. All but 20 paid off.

Some studies have spin-off benefits. For instance, a study made to improve the carrier arresting hook points on the Phantom II fighter aircraft unearthed a new supplier whose price for the arresting points was \$186 less than the price previously paid.

Considering the above results, the VE team feels it has uncovered some real savings opportunities—proving that a careful "second look" is well worth the time and effort.

WINS AND GRINS



The Commanding Officer of the USS SWORDFISH, CDR J. T. Riggsbee, presents checks of \$150 each to LCDR T. C. Maloney and Storekeeper First Class L. R. Addiss. These are the first beneficial suggestion awards given by the San Francisco Bay Naval Shipyard to forces afloat under the comparatively new program to reward unformed personnel for suggestions. Maloney's idea eliminated a hull fitting on his ship under the SubSafe Program. Addiss' suggestion improved Univac supply reporting procedures.

CALL FOR PAPERS

1968 S.A.V.E. NATIONAL CONFERENCE IN ATLANTA, GEORGIA APRIL 15, 16, 17

Papers are welcomed on any of the areas listed under the primary topics. The intent is not to supply a title to your paper but to provide an area of interest.

TOPICS

I Training and Value Engineering

Papers should be directed toward the formal and informal approaches that are used presently or proposed for future training in Value Engineering.

- Establishing a Value Engineering College Curriculum
- On the Job Training vs. College Training
- What Makes a Good Value Engineer
- VE as a Major College Curriculum
- Preferred Background for VE
- History and Growth of VE
- How VE Differs from IE
- VE as a Profession

II Value Engineering in Management

Emphasis on management responsibilities and approaches should be the theme for papers in this category.

- Relationship Between VE and Other Management Disciplines Such as Zero Defects, Reliability, Pert, Cost Reduction, etc.
- Location of the VE Organization (Management Level) Within a Company
- Down the Road vs. Upstream Applications of VE
- VE Emphasis—Design and/or Manufacturing
- What Constitutes an Effective VE Program
- VE in Administration and Management
- Expected Return for VE Investment
- Use of Consultants in VE
- Organizing for VE

III Trends in VE Defense Contracting

Industry and DOD views on government contracts utilizing VE theme should be the subject of these papers.

- Standardization of Army, Navy & Air Force VE Requirements
- Min.-Max. VE Effort in Defense Contracting
- VE Accomplishments in Defense Contracts
- VE Contract Sharing Requirements
- Policy Standardization of VECF's
- VE in Specialized Programs: SST, C-5A, FDL

IV Controlling Cost Headaches

Proposed and implemented VE programs which are applicable to any industry are requested for panel presentations.

- Establishing and Operating VE Programs in Small and Large Enterprises
- Successfully Applied VE Programs in Commercial Industry
- VE Programs in State and Local Government
- VE Solutions to Cost Headaches
- VE in Purchasing

V Sources and Handling of Data for VE

Discuss new and proven approaches to VE technological methods to improve the overall performance of the VE practitioner.

- Mathematical Models and Formulae
- Setting Up Computer VE Systems
- Storage Methods of VE Data
- Advance Techniques
- Cost Saving Factors

Procedure For Submitting Papers

I. Prepare a 200-500 Word Abstract; Typed, Double Spaced

II. Submit Following with Abstract:

Title Page—Title of Paper, Author's Name, Position

- Company Affiliation—Single Paragraph Summarizing Contents of Proposed Paper (50 Words or Less)
- Biographical Sketch—100 Words or Less
- Estimation of Number of Charts, Graphs, etc. to be included in Final Paper, and the Approximate Number of Final Pages

Three Copies of the Abstract are to be Submitted No Later Than Sept. 15, 1967 to:

Guy E. Knowles, Jr.
Paper Selection Chairman
1741 Roswell Street
Smyrna, Georgia 30080

Notification of Acceptance:

Authors will be notified of the status of their abstracts during the week of November 23, 1967. Those selected will receive directions for preparation and submission of final papers. Finished manuscripts are due December 18, 1967.

NO TOLERANCE FOR WASTE



Thomas Yarbrough, left, and Harold Witmer, of the San Antonio Air Materiel Area, Kelly AFB, Texas, check out some repair parts which had been discarded for not meeting precise dimension tolerances. Yarbrough and Witmer proved that the tolerances were too rigid. As a result, condemned parts worth \$63,400 were reclaimed.

Greater tolerance often does as much for mechanics as for human relations. That philosophy is shared by Thomas Yarbrough, equipment specialist, and Harold Witmer, industrial specialist—both of the San Antonio Air Materiel Area, Kelly AFB, Tex.

Yarbrough and Witmer agree that every item should be designed to perform its necessary function consistent with all requirements for performance, reliability, quality, and maintainability. They question, however, the need to go beyond those requirements. For example, they feel that tolerance limits on many repair items such as gears, gear assemblies and shafts are entirely too rigid. Some items of this sort appear to be designed by watchmakers so precise and stringent are the tolerances.

Yarbrough and Witmer joined forces to see if something could not be done about the large number of gearbox components being condemned. The main difficulty, they found, was in the tolerance and dimension specifications. By taking some samples and making a few tests they were able to convince their superiors that many serviceable shafts and gear assemblies previously condemned could be reclaimed if tolerances were relaxed to a more realistic level.

Following through on this action and some related changes in gearbox repair methods, the duo was able to pile up savings for the Air Force of \$63,400 for fiscal year 1967. They estimate additional savings of a like amount each year in fiscal year 1968 and 1969. All in all, a pretty tolerable sum.

MISSILE-ANEOUS SAVINGS

Indicators that did not indicate and dummy missiles that did not last prompted two engineers at the Naval Weapons Handling Laboratory in Leonardo, N.J., to do something about them.

Douglas Osborn, Assistant Surface Missile Systems Engineer, conducted a value engineering survey of the shock overload indicator used on Terrier/Tartar missile shipping containers. After analyzing the results of a test program, Osborn determined that the indicator was unreliable since it produced false readings, resulting in rejections, retests, and return of missiles for rework. Based on this test, the indicators were eliminated from the system. With annual replacements running 2,000 units per year and rejections running 100 per year, the elimination of the indicators resulted in an annual saving of \$102,000 for the Navy.

Frank Wildey, Senior Design Engineer, designed dummy MK-48 Mod-0 Terrier and MK-49 Mod-0 Tartar missiles which were fabricated from masonite material to replace the existing higher cost, less rugged dummy missiles for use in training operations, handling exercises, and test and evaluation of containers and equipment, where damage would occur to the existing shape due to rough handling. During fiscal year 1966, 41 Tartar dummy missiles and 20 Terrier dummy missiles were produced, resulting in a saving of \$444,850 for fiscal year 1966.

Wildey has been responsible for the development of numerous weapons handling designs for Terrier, Tartar and Talos missiles for use at weapons stations and transfer-at-sea operations.

Captain A. B. Register, Commanding Officer, U.S. Naval Ammunition Depot Earle, at left, has just presented Certificates of Merit to Mr. Frank Wildey, Senior Design Engineer, second from left, and Mr. Douglas M. Osborn, Assistant Surface Missile Systems Engineer, at right, in recognition of their separate accomplishments in support of the Cost Reduction Program. Also participating in the ceremony was Mr. Robert Eberle, Value Engineer, third from left.



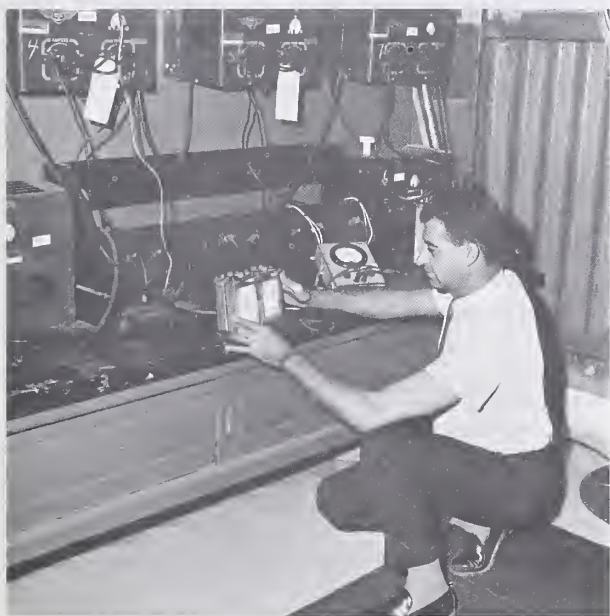
PUTS BIG WHEELS IN THEIR PLACE

Chief Machinery Repairman Louis R. McCann of Oceana Naval Air Station's Aircraft Maintenance Department received a check for \$180 for his suggestion entitled: "F4J Main Mount Tire Build-Up Alignment Tool."

Designed for the Phantom F4J, the tool makes it easy to align bolt holes on the aircraft's wheels. The tool draws the two sections of the wheel together for installing and torquing the bolts. Three "spikes" actually pass through three of the bolt holes to give proper alignment.

In addition to a \$1,019 saving for the current fiscal year, the tool will figure substantially in the air station's cost reduction results for the next 2 years.

BATTERY BOOSTER SPARKS NEW LOOK



Mechanical Engineer Edward X. Zuniga shocked inventory managers at the San Antonio Air Materiel Area, Kelly AFB, Tex., when he suggested that there might still be plenty of life left in some silver zinc batteries recently marked overage. The batteries had been stored for more than the accepted storage time of 3 years and were slated for discard.

Since the batteries were stored dry under reasonably good conditions, Zuniga felt they should have a longer shelf life than the specified 3-year limitation. To prove his point he tested the batteries and found them like new.

Based on Zuniga's test results, the Air Force approved the batteries for issue. This action enabled the Air Force to cancel procurement of a like number of batteries, thereby saving \$8,100.

Photo shows Zuniga testing one of 79 silver zinc batteries that had been declared overage.

LOADING SUITS CARGO HANDLERS TO A "T"



At Defense Depot Tracy, Calif., it used to take two forklift trucks, two operators, and one laborer to load unwieldy bundles of heavy structural steel.

Now with the use of a mobile "T-bar" device (see photo) the same job can be done with only one forklift truck, one operator, and one laborer. The job can also be completed in half the time.

Using the new method, the forklift operator brings the steel to the loading site and rests the bundles on the T-bar stand and on the end of the truckbed. The forklift then moves around to the protruding ends of the bundles, lifts the steel enough to permit removal of the T-bar, and pushes the bundles directly into the truck.

Tracy Depot, a field activity of the Defense Supply Agency, plans to save more than \$16,000 in fiscal year 1967 by use of this new loading procedure. In the photo, forklift operator Leland Jones and Al Martin, operating the T-bar device, demonstrate the new loading procedure.

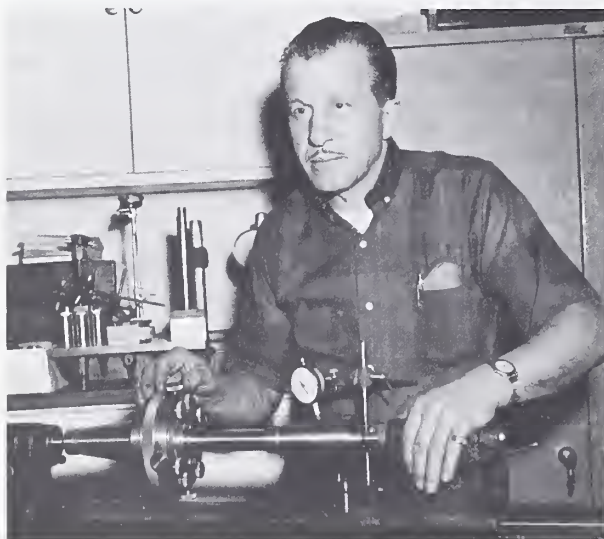
MATCHES CARRIAGE TO CARGO



The photo shows Captain J. W. Wade (right), Deputy Commander of Transportation Division, who presented Certificate of Merit to Mr. P. F. Palmieri.

One man's acumen for economically marrying transport kind and capacity to cargo requirements earned him a Navy Certificate of Merit. The recipient of the award is P. F. Palmieri, a Traffic Management Specialist assigned by the Navy Material Transportation Office, Norfolk, to the Navy Facilities Engineering Command, Washington, D.C. His judgment in picking the right ways to ship high priority cargo and unusually bulky or heavy items boosted Navy cost reduction accomplishments.

Palmieri is one of six traffic management specialists assigned to the several Naval Systems Commands. These specialists advise procurement and stock control personnel and help solve problems in distribution, movement of items having special transportability characteristics, and in reviewing policy directives issued by their Commands which may affect transportation costs or effectiveness.



ONE GOOD TURN DESERVES ANOTHER

. . . and in this case the turn of a machine spindle earned tool and gage maker Atilio Giombetti (photo) a check for \$60 at the Defense Depot, Tracy, Calif. Mr. Giombetti, who is employed in the Tracy Depot's Industrial Plant Equipment Operations directorate, earned the award in the Depot Incentive Awards program by inventing a means by which a worn spindle can be re-ground, or turned, without removing it from its shaft. By employing a secondary test bar which has the correct taper, the required taper per foot can be turned in place on the original spindle. Mr. Giombetti estimates that his invention saves about 30 man-hours per job. The device, which has other applications in leveling and testing machinery, is expected to result in an annual savings of more than \$1,100 for the Depot, a field activity of the Defense Supply Agency.

OPERATION INGOT

The Convair Division of General Dynamics could recover more than \$1 million over the next 5 years by a new procedure of handling aluminum scrap metal from the division's milling operations.

Convair has signed an agreement with a Los Angeles smelting company for conversion of all aluminum turnings and borings into ingots for resale by the division. The project is called "OPERATION INGOT" for increased net gain on turnings.

Until now the metal has been sold in bales by bids on two or three carload lots. The anticipated increase in the amount of metal used in the division's aerospace programs made a change of procedure imperative from a standpoint of storage and handling.

Under the recently signed contract with Aaron Ferer & Sons, Inc., a subsidiary of Whittaker Corp. of Los Angeles, the metal will be picked up in loose condition, transported to the smelter, converted to assayed ingots and chemically analyzed for exact contents.

The ingots, 20 to 50 pounds in weight, will be stored until Convair directs their sale.

Ray Lange, Convair supervisor of material sales, who was responsible for initiating the new procedure, said that groundwork for the change in handling was laid almost a year ago.

"We foresaw difficulties in handling the tremendous quantities of turnings and borings which must be disposed of during coming production of C-5 and F-111 components," Lange said.

Over 22 million pounds of aluminum scrap metal are expected to accrue from division operations in the next 5 years. Some 3,000,000 pounds will be turned out this year, and as much as 7,000,000 pounds by 1969.

According to Lange, the local servicer cannot store more than 200,000 pounds at any one time, and the baler cannot handle Convair's borings which amount to half a million pounds a month. Shipment of baled metal is limited to local markets since a freight car will hold only 40,000 pounds of baled metal, while a minimum of 60,000 pounds is required for transport to the East Coast.

"The volume of metal thrown on the local market keeps the prices in a fluctuating state," explained Lange. "Now that we have facilities to store thousands of pounds of ingots we can take advantage of all markets and the best price offers," he said.

The first batches of aluminum turnings and borings were shipped to Los Angeles the first week in May. Over 300,000 pounds had been accumulated over the month and a half since the contract was signed the latter part of March. Although the present arrangement calls for the San Diego handler to pick up the metal and truck it to the Los Angeles smelting firm, future planning may see a smelter located in the San Diego area to process metal for Convair as well as for other companies.

IDEA INTERCHANGE AT GENERAL DYNAMICS

K. B. Bitter, General Dynamics' Corporate Cost Reduction Coordinator, issues a quarterly "Interoffice Communication" containing cost reduction ideas submitted for interchange by the divisions of the corporation. Copies are sent to Cost Reduction Coordinators of all General Dynamics divisions. If further information on any idea is desired, a reader is provided the name and telephone number of the divisional coordinator.

A recent interchange memo included the following ideas:

- Pomona Division reported savings of \$14,700 through elimination of hand cleaning operations by use of a vacuum-formed cylindrical mask for spraying "Redeye" shrouds with primer.
- Canadair Division reduced inspection costs for blind areas of aircraft fuselage units from \$10.10 to \$1.30 per unit by use of "Borescope" instead of X-ray equipment to inspect for cleanliness.

- Fort Worth Division saved \$106,841 through revision of an engineering specification, as the result of a Value Engineering evaluation, to permit the use of welded tubing instead of seamless tubing in the F-111 aircraft hydraulic system.
- Stromberg-Carlson Division saved \$73,000 by simplifying its method of connecting 34 wires to a switch.
- General Atomic Division, as a result of its continuing review of classified document retention requirements, was able to destroy 6,881 secret and 2,044 confidential documents during 1966 and saved \$54,650.
- Electric Boat Division saved \$24,000 through consolidation of all purchase orders issued to the same supplier into one.
- Convair Division saved \$109,243 by extending the shelf life of 162 items an average of 55.5 percent, after consulting with its suppliers to determine the maximum shelf life of the items.

TRAILER TURNS NEAT TRICK



Old Method—Personnel of the 465th Field Maintenance Shop perform the 300-hour conditioning check and trim on a jet engine. The equipment used for these checks was subject to excess handling and damage from being spread on the ground and from repositioning after each engine check.



New Method—TSgt Billy G. Rentz of the 465th Field Maintenance Squadron suggested consolidating on a trim trailer all the equipment required to trim and perform the 300-hour reconditioning cycle for jet engines. His trailer, shown above, kept the equipment out of the weather and away from vibrations given off by engines at full power and eliminated equipment damage due to excess handling.

It takes a bunch of checkout equipment, tools, cables, and hoses to run the 300-hour conditioning check on jet engines at Robins Air Force Base in Georgia. There was a time when this paraphernalia was spread on the ground and repositioned after each engine checkout—making the supplies and equipment damage-prone from weather, from vibrations of fully powered jet engines, and from repositionings after each engine conditioning.

Not any more, though. SSgt. Billy G. Rentz of the 465th Field Maintenance Squadron gave the problem a thought or two and suggested a trailer specially designed for the job. Now this compact little wagon neatly moves the material from spot to spot, sparing the wear-and-tear associated with the old method and reducing the annual replacement of unserviceable items by \$41,600.

SSgt. Rentz received \$700 for his idea.



Colonel Madison M. McBrayer, Commander of the 465th Bomb Wing presents an award to TSgt Billy G. Rentz for suggesting a trim trailer to consolidate equipment.

FOREMEN FOREMOST IN IDEA DEPARTMENT

The three enterprising foremen of the Roads and Grounds Division, Fort Gordon, Ga., shown in the photo at right are saving the Army more than \$9,500 annually from suggestions which netted them a total of \$480.

Frank Norton, at right in photo, a carpenter lead foreman, illustrates his idea for purchasing replacement doors and window sashes already presealed and painted, instead of buying them unfinished. He sold his idea by making a few simple cost comparisons which proved that about \$1,300 could be saved each year by eliminating the need for separate painting of these items. He received \$70 for his suggestion.

At center, helping with the props, is Robert R. Martin, general construction and maintenance foreman, who appears anxious to talk about his ideas for improving Post Engineer Vehicles (note truck in background). Martin received a cash award of \$310 for suggesting the construction and installation of steel compartment boxes on truck bodies. The compartments enlarge carrying capacity, thereby reducing the number of times the trucks have to return to the shop for needed items or for replenishment of supplies. The boxes are tamperproofed for safe hauling of poisonous materials such as pest control chemicals. This security feature also makes it possible for the trucks to remain loaded overnight, thus eliminating time and manpower



needed to unload at the end of the workday and reload the next morning. Since approval of the idea, 23 boxes have been installed on 14 vehicles. Savings are estimated to be \$6,150.

The third gentleman in the group (at left in photo) is William B. Harper, a heavy equipment lead foreman who devised a unique circulating system for asphalt tanks. Harper fashioned a system of pipes and valves from salvage material that keeps asphalt continuously circulating and ready for instant use. Make-ready time for loading and application has been reduced from 3 hours, which includes mixing, to 10 minutes. Harper's reward for the \$2,060 savings was \$105.

COSTS TUMBLE AT COLLINS

Collins Radio Company now uses rocks, tacks, water and soap in a tumbling machine to remove burrs remaining in the holes of metal parts after sanding. The burrs formerly were removed with a deburring knife. The manual method was time-consuming and sometimes did not catch all of the burrs. Any burrs that were overlooked could cause an equipment malfunction if dislodged after assembly.

OLD METHOD



Mr. Duane Whiting of Collins' Cedar Rapids Region submitted the idea of using grey rock, tacks, water and soap in a tumbling machine to get rid of the burrs. Eight to 10 parts are tumbled per load. The tumbling takes 1 or 2 hours, depending on the size of the burrs to be removed.

Collins reported savings of \$48,000 from this new process in its Cost Reduction Program.

NEW METHOD



GOLDEN ACHIEVERS AT MARTIN



John F. Reus (left in photo) and James J. Collins (at right), both Creative Illustrators in the Pershing missile program's Technical Illustrations Group at Martin Marietta's Orlando Division, recently received Martin's Golden Achievement Awards. The awards (engraved trophies containing uncirculated \$10 gold pieces) were presented to the pair by G. T. Willey (center), Vice President and General Manager, in recognition of their development of a novel and simplified technique for preparing technical illustrations for handbooks and other publications.

The new method, which won the Division's top award for the year, has already saved \$79,000 and promises considerably more. The two employees previously received Silver Dollar Award desk trophies which are given by Martin each month for major cost-savings.

LOCKHEED WRINGS SAVINGS FROM CABLE LAUNDRY



The Lockheed Missiles and Space Co., Sunnyvale, Calif., reports a cost savings of \$68,693 through the development of a cable tubing washer. The washer, invented by G. W. Fosburg and R. G. Habershtock, removes powder used in the manufacture of the tubing. Previously, the powder had prevented proper adhesion of molding materials when the tubing was used in cable manufacture. The savings result from elimination of cable scrap or rework. In above photo, S. G. Staley, LMSC employee, demonstrates the washer.

ously, the powder had prevented proper adhesion of molding materials when the tubing was used in cable manufacture. The savings result from elimination of cable scrap or rework. In above photo, S. G. Staley, LMSC employee, demonstrates the washer.

DORA'S DILEMMA

Capable and industrious DORA used to work at the General Dynamics plant, Fort Worth, Tex., on the F-111 contract. Suddenly she found she was no longer needed. She was shunted aside and neglected.

She might have had a serious breakdown if an alert Air Force psychologist had not taken her under his professional care. He was able to demonstrate that with a few special treatments and some minor adjustments, DORA could once again perform a useful service. Most important, he was able to show that she was really needed.

The man who rehabilitated DORA is Andrew R. Jeffers, an engineering psychologist with the Systems Engineering Group, Wright Patterson Air Force Base, Ohio. His patient DORA (short for Dynamic Operator Response Apparatus) is a developmental simulator used to depict cockpit and flight characteristics for aircraft development work.

The Systems Engineering Group needed a highly flexible simulation device to help engineers design weapons systems. A device of this type would have cost the Air Force around \$2,791,000.

Jeffers found that DORA was surplus at the Fort Worth plant. He pointed out that with minor modification, DORA could fill the requirement. Shortly afterward, DORA was transferred to Wright-Patterson AFB, modified, and put to work.

Latest reports indicate that DORA is performing as expected. The equipment enables engineers to detect and resolve crew station design, equipment, operation, and human factor integration problems at a much earlier point in weapon system design than ever before possible. An additional benefit is the ability to test equipment configuration and operation problems in a ground-based environment rather than relying solely on more costly flight procedures.

Epilogue. Through Jeffers' efforts, DORA is once again doing useful work. The Systems Engineering Group is obtaining the valuable data needed. The Air Force has saved \$2,791,000.

The photo shows Jeffers testing DORA.



OPEN AND SHUT CASE



Aircraft have cowls and cowls have hinges and hinges cost \$9.23 each—and therein lies a tale.

High rates of hinge replacement caused Warner-Robins Air Material Area to apply the time and talents of two engineers to this likely subject for value analysis. The engineers, Dan Masson (seated in photo) and Lt. James Files (standing), found that the metal components pressed against a fabric inlay which served as a seal and that wearout of this fabric was the prime cause of hinge replacement. They also found that the fabric components could be purchased separately for \$1.87 per hinge and inserted in the hinge—thus precluding purchase of new hinges.

At current hinge replacement rates, that computes to an Air Force savings of \$33,540 by fiscal year 1969.

DOES NOT COTTON TO HIGH-PRICED FABRIC

It was curtains for expensive surgical drapes when an ex-medical corpsman found a \$26.03 unit price too bitter a pill to swallow.

The drapes (sheeting with voluminous folds and poncho-type styling) are used to clothe the patient during surgery. The Defense Personnel Support Center in Philadelphia was in the market for 20,644 sets. The Center received only one bid—so high that it hit a raw nerve in Oscar Peay, a technologist with 9 years' experience in the Center's textile laboratory. Peay learned that the high price was attributed to the short supply of the particular cotton sheeting called for in the specifications. He then reviewed the characteristics of *all* available cotton fabrics and weighed relative values on the textile market.

He discovered that cotton jean cloth had lightweight and absorption qualities similar to the more expensive surgical sheeting. Based on this finding, he recommended that the Center purchase drapes made from the jean cloth.

The Defense Medical Materiel Board in Washington, D.C. approved Peay's recommendation. As a result, the Center purchased jean cloth drapes for \$15.85 each, amputating costs by \$210,359.

TYPING, ANYONE?



Here's a time-saving gimmick devised by Lawrence J. Popp, Cost Improvement Manager of the Boeing Co.'s Aerospace Group. When a secretary is caught up on regular assignments, she displays a sign indicating that she can handle additional typing.

In the above photo, Terry Wellsandt receives fill-in typing from K. B. McGlashan, Contracts Manager in Boeing's Missile and Information Systems Division.

STIMULATING JOB

Mrs. Nancy J. Massar, then a Cost Reduction Awards and Publicity Monitor for USAF's Military Airlift Command, is shown reviewing a batch of savings examples to make sure that employees who cut costs receive appropriate recognition. Mrs. Massar is now with the Department of the Army's Incentive Awards Program.



PLASTIC MIXER CREATES STIR

A mouth-opening display of silicate cement for front teeth fillings at a recent dental supplies trade show in New York City scraped \$28,247 from Defense Supply Agency purchases.

The exhibitor of the cement asked spectator Mrs. Genevieve Probst whether she wanted more information about it. Said Mrs. Probst: "The silicate is interesting but it is the spatulas that are really exciting."

And they were—to a supervisory dental engineer at the Defense Personnel Support Center in Philadelphia which is who and where Mrs. Probst is.

Mrs. Probst evaluates dental equipment bought by the Center for the Armed Forces. This evaluation responsibility carries with it the duty to constantly search for low-cost items that will serve as long and as usefully as more expensive types previously purchased. Her interest in the plastic spatula at the show stemmed from the Center's pending purchase of 4,608 chrome-cobalt spatulas at a unit cost of \$6.50. The plastic spatulas cost 37 cents each.

Upon her return to work at the Center's Directorate of Medical Materiel, Mrs. Probst immediately set up a value analysis on the plastic spatulas. Tests revealed that they were suitable for mixing silicate cement materials (acid-soluble glass) and could be substituted for the present standard item of supply, the metal spatula.

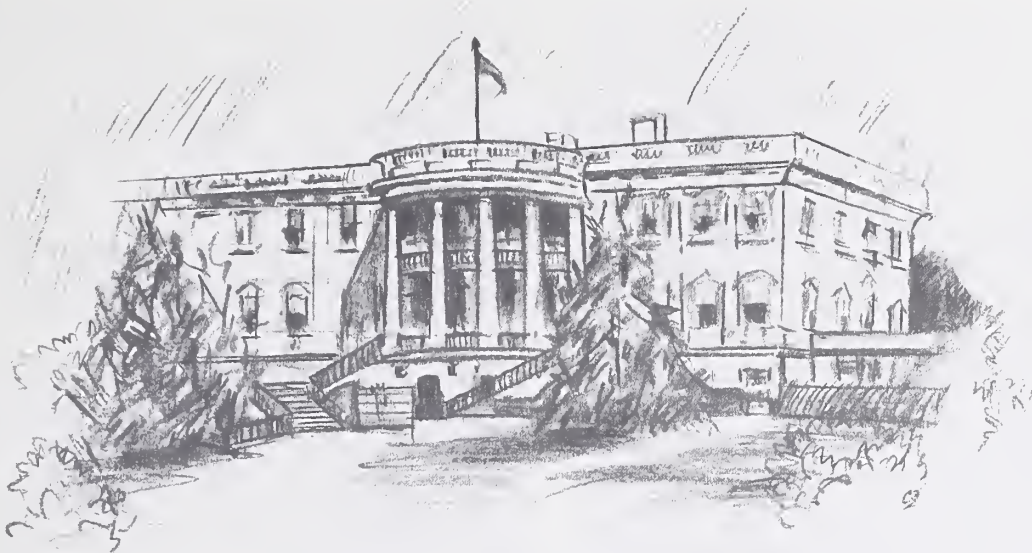
Her recommendation to substitute the plastic spatulas was submitted to the Defense Medical Materiel Board in Washington, D.C. Prompt approval by the Board resulted in savings of \$28,247 when the Support Center purchased plastic spatulas instead of the metal type.

FOR WHOM BELL TOLLS?

Closer control over toll telephone calls by all units at Eielson AFB, Alaska, saved Alaskan Air Command \$3,700. The idea for the saving came from TSgt William L. Wilson, Cost Reduction Monitor for Telecommunications Management in the 1995th Comm Sq (AFCS). He recommended closer monitoring of telephone toll calls and better controls to assure toll calls were made only when necessary rather than as a matter of convenience.

This control is administered over all units at Eielson AFB by assigning blocks of numbers to each organization. The numbers that have been used are reported to the 1995th, with an explanation as to the purpose of each call and its duration. Unused numbers are returned to the central controlling agency.

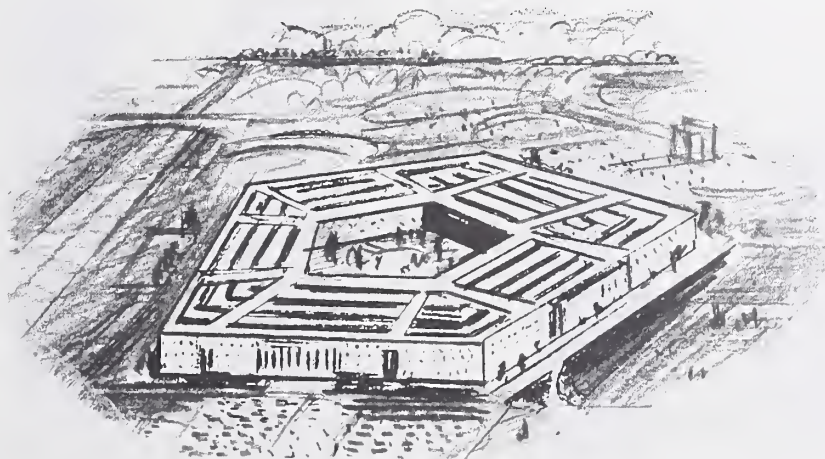
This system enabled the 1995th to establish trends of undesirable practices and to suggest to chronic offenders ways for improving their telephone operation.



COST REDUCTION PROGRAM

ANNUAL PROGRESS REPORT

The White House, Washington, 7/5/67.—“I believe you will find the attached report from Secretary McNamara highly informative. It describes the progress of the Defense Department’s Cost Reduction Program and the savings achieved during the fiscal year just ended. I am particularly pleased with the alertness shown to the opportunities for cost reduction despite the pressure of combat operations. We are determined to provide our men with everything they need to accomplish their mission but we believe, and the report proves, that such an objective is not inconsistent with continued emphasis on the elimination of waste and inefficiency.”—Lyndon B. Johnson.



(Report follows on next seven pages)

THE SECRETARY OF DEFENSE
WASHINGTON

5 JULY 1967

MEMORANDUM FOR THE PRESIDENT

SUBJECT: Department of Defense Cost Reduction Program—Annual Progress Report.

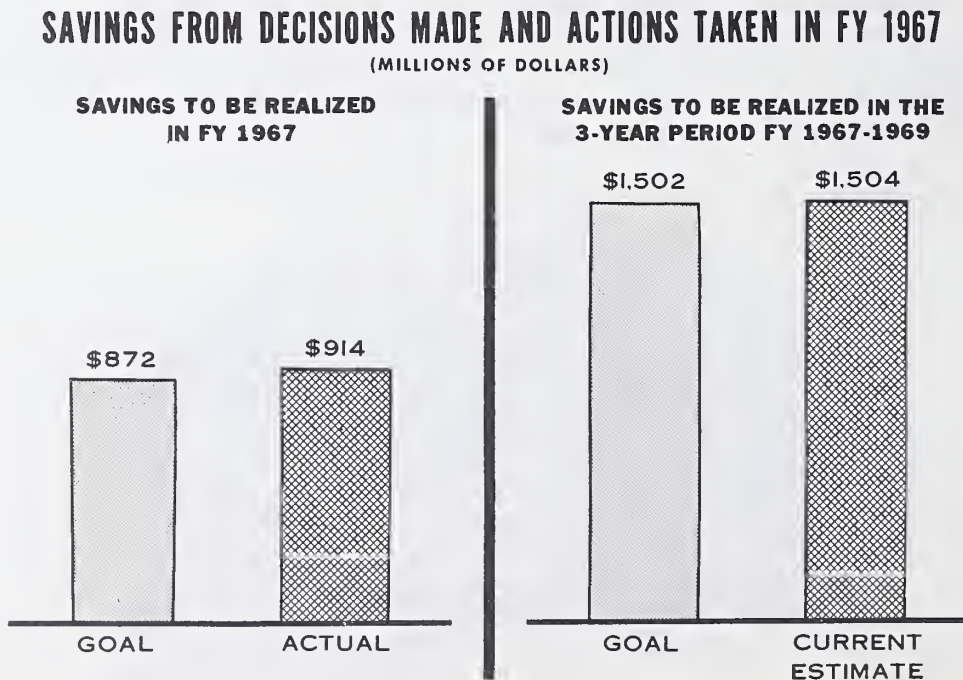
A year ago I reported to you on the completion of the Defense Department's initial 5-year Cost Reduction Program—a project which produced savings of more than \$14 billion in the 5-year period. I told you then that the program was being established on a permanent basis as an integral part of the Defense management system, with goals to be established and cost savings to be measured on a year-to-year basis. Today I can report to you the results of the first year on the new basis:

- *Savings of \$914 million* were realized during fiscal year 1967 from cost reduction actions taken in that year, and
- *Additional savings of \$590 million* will accrue from the fiscal year 1967 actions in fiscal year 1968 and fiscal year 1969. The fiscal year 1967 decisions, therefore, will produce total savings of \$1,504 million in the 3-year period fiscal years 1967–69.

As shown on the chart below, the results from fiscal year 1967 actions are now expected to exceed the goals

set for each of the two periods.

The initial 5-year Cost Reduction Program, formally launched in July 1962, was a truly pioneering effort in defense management. Over and above the large monetary savings achieved—more than \$14 billion during the 5-year period—the program significantly raised the level of effectiveness of the entire worldwide logistics system. Tangible incentives for economy and efficiency were provided to the thousands of managers throughout the Department. Goals were established in cooperation with the participants in the program and performance was uniformly and regularly measured against those goals. The results were audited separately by an agency independent of the management structure. Public recognition was afforded to those individuals who performed in an outstanding manner. The skill and competence level of the entire management structure was raised through systematic training programs.



During this period, new procurement techniques were developed and brought into everyday use to broaden the area of competition for Defense work and to minimize the use of cost-plus-fixed-fee contracts. Requirements computation methods were thoroughly reviewed and more realistic standards established. New procedures were devised to insure maximum utilization of excess inventories on a Department-wide basis. Special "value engineering" staffs were organized in all of the Department's procurement agencies to eliminate "gold-plating" (i.e., unneeded frills) from specifications. Defense contractors were offered a share in the savings resulting from "value engineering" changes which they originated. Programs designed to increase the efficiency of the day-to-day operations of the Department were established at the base level. Defense installations were systematically reviewed and those excess to our requirements were closed and the property turned over to more productive public or private use.

Many of the cost reduction actions taken during that period will continue to generate important savings for years to come. But perhaps the most lasting benefit over the long run will be the higher level of efficiency and the persuasive incentives for economy which have now been built into the entire logistics management structure. In a program as dynamic and extensive as Defense the possibilities for further improvement can never be exhausted. As old problems are solved, new problems appear. The great burden imposed on our logistics system by the military operations in Southeast Asia, for example, not only provided a stern test of its capabilities but also opened up new opportunities for savings. A considerable number of the cost reduction actions reported in fiscal year 1967, some of which are described later in this memorandum, grew out of that logistics effort, proving once again the point you made last year "that we can have both combat readiness and economy in Defense."

Now that the policies and procedures for the Cost Reduction Program have been firmly established throughout the Department, the program has been shifted to a permanent basis. In terms of overall coverage, the program remains the same. The principal change concerns the manner in which the savings are reported. Beginning with fiscal year 1967, savings will be reported in the year in which the specific action or decision giving rise to the savings was initiated. Even though the savings from a particular action may continue for 5 or 10 years, the reported savings will be limited to those which will be realized in the year of decision and in the next 2 succeeding years. Moreover, no credit has been taken in fiscal year 1967, or will

be taken in any subsequent year, for any savings accruing from actions reported prior to July 1, 1966, thus understating the true savings generated by the initial 5-year Cost Reduction Program. Although the new reporting procedure will inevitably understate the full dimensions of the savings achieved, I believe it will provide a more easily understood accounting for the general public.

As you know, I have insisted from the very inception of the Cost Reduction Program on an audit of the reported savings in order to ensure that they are bona fide (the audit is now performed by the Defense Comptroller). This is simply good business practice: No manager should report on his own performance without some form of independent verification. That is why I invited the General Accounting Office to undertake a full audit when the program was first instituted, but for understandable reasons the Comptroller General thought it would be inappropriate. Beginning in fiscal year 1968, however, the General Accounting Office will, as part of its Government-wide review of internal audit activities, review our audit program and our criteria for measuring savings to insure their adequacy. Although I would still prefer a full General Accounting Office audit, the more limited arrangement will serve as a useful external check on the soundness of our auditing procedures and, hence, on the validity of the savings reported.

The Cost Reduction Program has three major elements: Buying Only What We Need, Buying at the Lowest Sound Price, and Reducing Operating Costs. The following is a progress report on actions taken in these three areas during fiscal year 1967.

I. BUYING ONLY WHAT WE NEED

The acid test of logistics effectiveness comes when large forces must be deployed quickly to distant trouble spots and supported in sustained combat. Such a test was provided by the conflict in Southeast Asia where we now have a total of more than 530,000 military personnel (including those afloat) at the end of a 10,000-mile supply pipeline. General Wheeler, Chairman of the Joint Chiefs of Staff, stated earlier this year:

"Our logistic achievements have verged on the incredible. Anyone who recalls the Vietnam of 18 months ago, and now sees the bases and fields and depots, must be tremendously impressed. I would repeat what I said recently in Saigon—no fighting force in military history has been supported more effectively than our men in Vietnam."

The high degree of combat readiness, which was achieved during a period when cost reduction and operating efficiency were being pursued vigorously, proves that these goals are not incompatible. Therefore, in fiscal year 1967, we have continued our management efforts to limit our purchases to only what we need by:

- Applying the most advanced techniques to the prediction of consumption so as to minimize overages while avoiding shortages.
- Screening our excess stocks so that as much of them as possible can be used in place of new purchases.
- Accelerating all logistics operations so that a faster resupply capability can be translated into lower investments in "pipeline" stocks.

Savings realized in fiscal year 1967 from cost reduction actions during the past year in this area are estimated at \$613 million; for the 3-year period, fiscal years 1967-69, savings from fiscal year 1967 decisions are expected to total \$843 million.

A. *Refining Requirements Calculations*

Thousands of "requirement" reviews of major items of equipment, spare parts, and "consumables" have been conducted to help determine our real needs and avoid procurement of materiel which might later prove surplus. More accurate predictions of wearout rates are being made through the use of automatic data processing equipment. Pipeline requirements are being reduced by the use of airlift to deliver high cost items. Better demand forecasts are being achieved through the widespread use of high-speed communications systems and by concentrating management effort on high-value items. Special review boards have been established to screen the need for the thousands of tons of reports, manuals, engineering drawings, and other technical data required each year to develop, operate, and maintain our equipment.

For example:

- The Air Force, by moving its C-141 landing gear repair activity to the same base where the aircraft itself is maintained, was able to cut pipeline requirements for spare parts and transportation packing costs, saving \$247,500 in fiscal year 1967 and \$2,373,800 for the 3-year period fiscal years 1967-69.
- The Defense Supply Agency was able to reduce its investment in 31 selected medical items by contracting for their delivery on an "as required" basis instead of continuing to make large "automatic" replenishments, saving \$1,041,469 in fiscal year 1967.
- The Air Force was able to cancel the requirement for an engineering report, related to the field repair of the C-5A transport, after study showed that the

needed information could be obtained from existing sources. Over \$1.5 million was saved in fiscal year 1967 alone.

Actions like these saved \$301 million in fiscal year 1967, and the fiscal year 1967 decisions are expected to save a total of \$421 million in the 3-year period fiscal years 1967-69.

B. *Use of Excess Inventories*

The taxpayer gains every time some way is found to use an item from our stocks of surplus equipment and supplies to satisfy a current requirement in lieu of new procurement. Approximately \$1.8 billion of such excess stocks were so used by the Department of Defense in fiscal year 1967. New ways of using such stocks, developed in fiscal year 1967, included the following:

- The Navy reclaimed lead elements from spent submarine batteries, converting them into lead ingots for use as submarine ballast. \$91,088 was saved in fiscal year 1967.
- The Defense Supply Agency reprocessed excess duck fabric purchased for lining Quonset huts and used it to make flight bags for the Air Force. \$118,526 was saved in fiscal year 1967 and savings for the 3-year period fiscal years 1967-69 will total \$73,916.
- The Air Force modified four excess Marine Corps ground radar sets to meet a Vietnam operational requirement at a cost of \$24,296, realizing a net savings of \$336,762 in fiscal year 1967 and \$673,524 for the 3-year period fiscal years 1967-69.
- The Marine Corps met an urgent requirement for 90-mm. high explosive tracer cartridges in Southeast Asia by modifying its own fuses to fit excess Army rounds. The needed ammunition was obtained more quickly than would have been possible by new procurement and \$1,448,000 was saved.

The savings achieved by these actions initiated in fiscal year 1967 will total \$33 million in fiscal year 1967 and \$42 million for the 3 fiscal years 1967-69.

C. *Eliminating Goldplating*

The Nation cannot afford the luxury of paying for design or performance features that contribute nothing to military effectiveness. Such unneeded features are often introduced into design specifications either because the designer is overzealous or because there is inadequate practical experience on which to base a sound judgment. To prevent such "goldplating" of specifications, we have in recent years greatly augmented our "value engineering" staffs and conducted

a vigorous education program to increase their skills. In addition, strong financial incentives have been introduced into our contractual arrangements to encourage defense contractors to exploit every "value engineering" opportunity which presents itself. Recent departmental regulations have improved these contractual incentives by:

- Expanding the opportunities for a contractor to earn a greater share of his "value engineering" savings—in some cases to over 50 percent.
- Extending the period during which a contractor can share in savings accruing from subsequent applications of his "value engineering" changes—up to 3 years.
- Shortening the time a contractor must wait for payment of his share of the savings.

We estimate that "value engineering" changes made during the year yielded savings of \$276 million for fiscal year 1967 and \$377 million for the 3 fiscal years 1967-69. Of special interest this year are some of the examples drawn from our operations in Southeast Asia:

- Instead of buying dual-fuel (i.e., coal or oil) hot water heaters for use in Vietnam, the Defense Supply Agency eliminated the coal burning components since that fuel is not readily available in the area. Savings in fiscal year 1967 will be \$214,338.
- By changing specifications for prefabricated aircraft hangars for Vietnam from shed-type to double-gable roof construction, the Navy was able to buy competitively a standard building which not only could be delivered faster but also produced savings of \$311,298 in fiscal year 1967.
- Each MK-81 and MK-82 bomb sent to Vietnam was being supplied with a hoisting lug to help lift it to the aircraft. The Navy found that these lugs were being discarded because the bombs were being loaded either by hand or hydraulic lift. Elimination of the lug reduced costs by 88 cents per bomb. Savings will be \$620,048 in fiscal year 1967 and \$1,923,048 for the 3 fiscal years 1967-69.
- Studies showed that thickness specified for parking aprons and taxiways at Phan Rang airfield could be safely reduced, saving \$928,000.

II. BUYING AT THE LOWEST SOUND PRICE

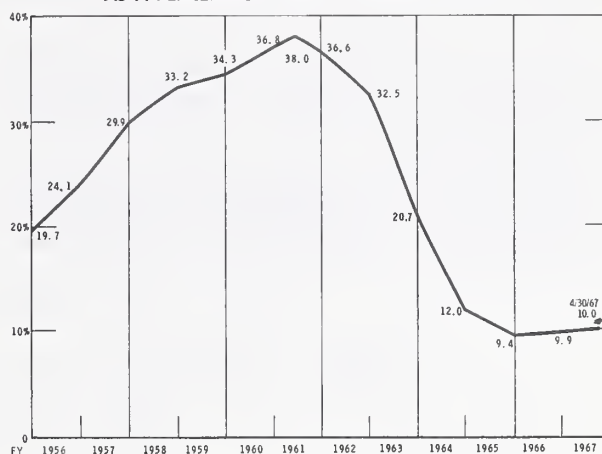
Military prime contract awards for the first 10 months of fiscal year 1967 increased 20.4 percent over the same period last year. Despite the greater volume of procurement and the special pressures resulting from our combat operations in Southeast Asia, we were able to

hold the gains made in recent years in increasing the volume of competitive awards and reducing the use of cost-plus-fixed-fee contracts. The new actions taken in fiscal year 1967 will save \$54 million in fiscal year 1967 and \$95 million for the 3 years fiscal years 1967-69.

A. Shifting Away from Cost-Plus-Fixed-Fee (CPFF) Contracts

One of the major accomplishments of the first phase of the Cost Reduction Program was the reversal of the long existing trend towards greater use of cost-plus-fixed-fee contracts. This type of contract, which is usually justified only when there are great uncertainties

COST PLUS FIXED FEE CONTRACTS
AS A PERCENT OF TOTAL CONTRACT AWARDS

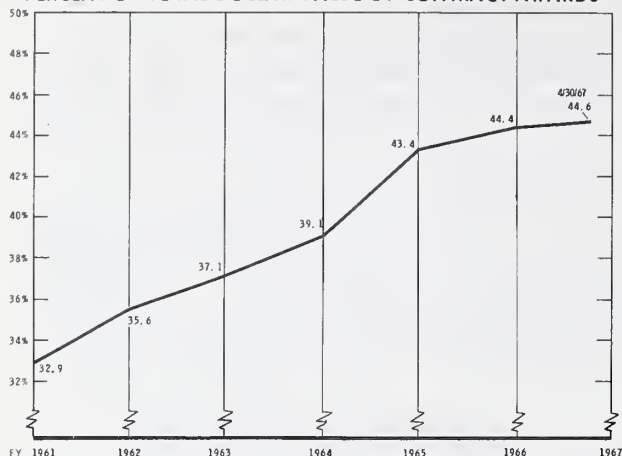


involved, offers neither reward for good performance nor penalty for bad. Between fiscal year 1961 and fiscal year 1965, the proportion of CPFF contracts was driven down from 38 percent to less than 10 percent, and despite the extraordinary demands of the Vietnam conflict, we have been able to hold close to that level through the first 10 months of fiscal year 1967.

B. Shift to Competition

As I noted earlier in this report, we have also developed and introduced into our purchasing operations a number of new techniques designed to broaden and intensify competition for Defense work. For example, when specifications are too broad to permit formal advertising, producers are being asked to submit unpriced technical proposals. Producers whose proposals qualify then submit sealed bids with the award going to the low bidder. Or in cases where a complex end-item fails to attract competition, its high value parts and components are being "broken out" for separate procurement. These new techniques have helped to sustain

CONTRACTS AWARDED ON BASIS OF COMPETITION AS A PERCENT OF TOTAL DOLLAR VALUE OF CONTRACT AWARDS



the high level of competitive procurement achieved in recent years, notwithstanding the urgent demands of the Vietnam conflict.

Specific actions taken during fiscal year 1967 to shift procurement from noncompetitive to competitive types of contracts saved \$16 million in fiscal year 1967. Some examples are shown below:

	Noncompetitive unit price	Competitive unit price	Percent reduction	Savings
Test and calibration panels.....	\$4,565.25	\$2,887.00	37	\$57,044
Traveling wave tube..	1,289.10	702.00	46	58,710
Engine speed warning device.....	160.29	139.25	13	36,404
Fuel indicator, aircraft.....	1,135.00	683.00	38	107,576
Duct assembly, SH/UH-34 helicopter.....	363.90	196.25	46	84,899

C. Direct Purchase of Parts and Components

Parts and components used in major weapon systems can often be purchased directly from the vendor instead of indirectly through the prime contractor. Although this practice cannot always, in itself, induce competition, it can produce savings when the price paid the vendor is lower than that formerly paid the prime contractor. During the past year, "direct purchase" actions cut costs \$10 million in fiscal year 1967 and \$19 million for the 3-year period fiscal years 1967-69. Here are some examples:

	Prime contractor's unit price	Vendor's unit price	Percent reduction	Savings
Drive assembly, P-3A aircraft.....	\$3,360.00	\$1,843.84	45	\$92,982
Oil filter, tactical vehicles.....	10.50	8.40	20	17,793
Recording paper for computers....	13.50	8.39	38	82,782
Diode, 5-kw. generator.....	6.25	3.75	40	11,933

D. Multiyear Procurement

Large production runs over longer periods of time tend to yield savings through "learning curve" economies, the elimination of repetitive start-up costs and the amortization of tooling and facility costs over a larger number of items.

The Defense Department attempts to take advantage of this principle by consolidating into one contract 2 or more years' requirements for an item whenever this is found practicable. During fiscal year 1967, \$28 million was saved by taking advantage of the lower prices for multiyear procurement. For example:

	Unit price		Fiscal year 1967 net savings
	Single year	Multiyear	
Protective mask M-17A1.....	\$19.24	\$17.79	\$378,000
Signal generator AN/UR.....	2,777.00	2,450.00	205,356
Tank landing ship vessels (LST-1180 Class)....	15,346,500.00	14,653,588.00	11,779,504
Destroyer escort vessels (DE 1078 Class)....	11,066,000.00	10,887,000.00	3,580,000
Bombs, GP, MK84-1.....	405.91	330.60	644,000
Receiving multicoupler, AN/SRA-43....	722.00	694.00	170,508

III. REDUCING OPERATING COSTS

The improvements made during the past year in managing the base structure, maintaining equipment, operating communications systems, transporting men and materiel, and carrying out the other day-to-day operations of the military establishment resulted in savings of \$237 million for fiscal year 1967 and \$549 million for the 3 fiscal years 1967-69.

A. Terminating Unnecessary Operations

In fiscal year 1967, actions were initiated to consolidate, reduce, or close 39 Defense installations or activities involving property that had become surplus to all foreseeable peacetime and wartime needs. These new actions produced savings of \$8 million in fiscal year 1967 and when completed will produce annual savings of \$49 million. The table below summarizes the "base closure" program since 1961 and the new actions of fiscal year 1967:

	Total through 30 June 1966	Total through 30 June 1967	In- crease
Number of actions	878	917	39
Acres released	1, 810, 000	1, 818, 000	8, 000
Industrial plants with commercial potential made available for sale	66	66
Job positions eliminated	202, 273	206, 631	4, 358
Recurring annual savings in millions	\$1, 450	\$1, 499	\$49

From the beginning, we have recognized that this rechanneling of resources, though beneficial to the Nation as a whole, could have serious adverse effects on local communities and our own employees. Two programs, each of several years' standing, have been developed to help soften these effects.

One program is designed to help local communities find productive uses for the land and facilities made available as a result of base closures. Property released in recent years is now being used for airports, schools, and universities, community recreation and development, and commercial operations. The table below summarizes the disposition of military property released since 1961.

	Number of locations through—		Increase
	June 30, 1966	May 31, 1967	
Civil airports	28	34	6
Schools and universities	157	229	72
Parks, recreation, community development	90	104	14
Private industry for production	56	66	10
Individuals and small companies	306	494	188
Federally owned reserve lands	6	9	3
Other Federal agencies	79	99	20
Total acres involved	862, 788	924, 636	61, 848

During the past year, the Defense Department's Office of Economic Adjustment, whose services become available to a community just as soon as a "base closure" decision is announced, worked closely with 31 communities in 25 States to plan new uses for properties which we are relinquishing. One example of what can be achieved by this type of planning concerns the Springfield Armory in Massachusetts, which is scheduled to close in April 1968. The community's plan calls for: (a) selling the Armory's manufacturing area to the city for subsequent lease to industry; (b) conveying another area to the State to expand the Springfield Technical Institute; and (c) conveying still another area to the city for a museum site and high school athletic field. One major firm estimates that it will add 1,000 new jobs at facilities in the Armory's manufacturing area.

Our Employment Opportunity Program continues to achieve excellent results in finding new jobs for the Department's employees displaced by base closings. No career civilian employee has been separated without an offer of another job opportunity. The following table summarizes the program's experience with those employees affected by the base closure program between January 1964 and April 1967.

	Employees	
	Number	Percent
Accepted offer of another Defense job	78, 188	68. 8
Placed in another Federal job	4, 422	3. 9
Placed in a non-Federal job	2, 603	2. 3
Declined job offer, transfer, or placement assistance	9, 574	8. 4
Retired or resigned	16, 431	14. 4
Other (death, military service, etc.)	2, 532	2. 2
Total employees affected	113, 750	100. 0
Separated without offer of "job opportunity"	None	None

B. Reducing Operating Expenses

The day-to-day operations of the Defense Department offer a broad range of opportunities for cutting costs through such actions as consolidating management functions, finding more efficient organizational arrangements, simplifying work methods, and increasing productivity. A large number of such actions in fiscal year 1967, each involving relatively small amounts of money, will save \$84 million in fiscal year 1967 and \$197 million in the 3 fiscal years 1967-69. For example:

- The Air Force established eight regional pay offices in place of 20 separate base pay offices in the Strategic Air Command. Savings were \$148,319 in fiscal year 1967 and will be \$714,942 for the 3 fiscal years 1967-69.
- The Navy was able to speed the loading of bombs by modifying equipment, staggering work shifts, and conducting time-motion studies. Savings were \$339,000 in fiscal year 1967 and will be \$1,415,000 in the 3 fiscal years 1967-69.

C. Increasing the Efficiency of Other Support Operations

Communications systems costs, by actions in fiscal year 1967, were reduced by \$8 million in that year and by \$27 million for the 3-year period, fiscal years 1967-69, in the face of record communications traffic loads. Savings in this area are obtained through such actions as negotiating tariff rate reductions, eliminating unneeded circuits and equipment, and consolidating leased long-line communications.

Transportation and traffic management improvements in fiscal year 1967 netted savings of \$44 million in fiscal year 1967 and \$138 million for the 3-year period 1967-69.

- The Army's Anniston Depot in Alabama, by matching ammunition requisitions against incoming shipments at the freightyard and rescheduling entire carloads to the using organizations, was able to eliminate, in some cases, the normal process of unloading, storing, and then reloading boxcars, thereby saving \$61,186 in fiscal year 1967.
- The Air Force prepared 94 MACE missiles for ocean shipment by applying a protective coating instead of disassembling the missiles and sealing them in reusable cans as had been the practice. Savings were \$169,900 in fiscal year 1967.
- The Navy negotiated ocean cargo rates directly with the individual carriers instead of with the carrier associations as had been the practice. Savings were \$3.9 million in fiscal year 1967.

Improvements in maintenance management initiated in fiscal year 1967 saved \$27 million in that year and

will have \$59 million in the 3 fiscal years 1967-69. Typical actions included:

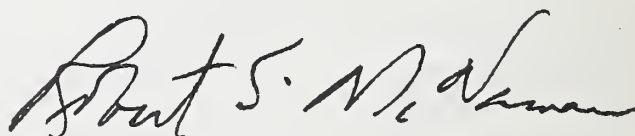
- Developing repair procedures to reclaim components previously discarded.
- Eliminating unnecessarily stringent requirements from maintenance guidelines.
- Buying bulk instead of drum quantities of fluids used in maintenance operations.
- Designing protective devices for damage-prone parts.

Additional savings from fiscal year 1967 actions totaled nearly \$35 million for fiscal year 1967 and will total \$73 million for the 3 fiscal years 1967-69. They were realized by:

- Improving the management of noncombat vehicles, military family housing, other real property, and the Military Assistance Program.
- Developing lower cost packing, preserving, and packaging techniques.
- Replacing contract technicians with civil service personnel.

CONCLUSION

Although the very large savings of more than \$14 billion achieved through the initial 5-year Defense Department Cost Reduction Program are not likely to be duplicated during the succeeding 5 years, I believe there are still significant opportunities for improvement, particularly in those activities which have been expanded so rapidly for the support of our military operations in Southeast Asia. Whenever the element of time becomes the overriding factor in our actions, economy and efficiency tend to be sacrificed in favor of speed. Consequently, I would not be at all surprised if some unnecessary spending and inefficiency have crept into the Defense program during these last 2 years of rapid buildup. Our task in the year ahead is, therefore, clear: it is to ferret out all these new sources of waste and inefficiency and tighten up our operations all along the line. Further savings of millions of dollars can be achieved by actions which are completely consistent with a high degree of combat readiness. I can assure you that this effort will receive my personal attention during the coming months.



GARBAGE DISPOSAL TAKES NEW TWIST

Everyone has heard the overripe old quip about the happy garbage man—he was paid \$1.50 a day and all the garbage he could eat.

The Seventh Detachment of the 362nd Signal Company in Vietnam can top that Joe Miller-ism. It has a garbage collector who demands no cash. In fact, he works for peanuts—or old chicken bones, or meat scraps or anything else remotely digestable.

The "garbage man" is a pet python affectionately named Charlie because (like the unloved Vietcong "Charlies") he habitually shows up in unexpected places at the wrong times.

Charlie, all 12 feet of him, holds the record for being the world's longest garbage disposal. In addition to his daily garbage ration (and as a loss-leader come-on for his services), he surreptitiously gobbles up lizards, rats, mice and other vermin that wander into bivouac.

Before Charlie made the scene, the detachment had trouble getting rid of its edible garbage. The man-made garbage pit attracted bugs, flies, and a wide va-

riety of jungle animals. The detachment dealt this messy melange a crushing blow when they recruited ole Charlie in a slick trade with a local farmer. Now there are no garbage problems, no vermin, and only the usual quota of insects.

Charlie does have some drawbacks. Obviously thick-skinned to reprimands, he constantly bellies up to the mess tent—apparently anxious to go into business for himself. Also, his garbage-picking habits leave something to be desired as he is inclined to get too wrapped up in his work. Finally, as one TV-conscious GI noted: "I don't care if it does hurt old Charlie's feelings—I'm going to tell him—he's got bad breath!"

We would like to finger Charlie as a contributing cost reducer. There has to be some saving there somewhere. However, not even the *JOURNAL* expects our fighting men in Vietnam to take time out to gather, compute and validate cost reduction reports. As for Charlie—we were kidding about the finger. Neither we nor the auditors would touch him with a 10-foot pole!

GOOD OLD GOLDEN RULE DAYS

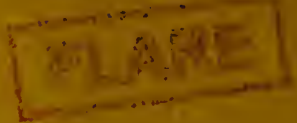
A pretty girl never hurt a presentation. The Navy Logistic Systems School buys that philosophy lock, stock, and nylons in pitching "The DoD Cost Reduction Program" to students in the Navy Department Orientation Course at the Naval Air Facility in Washington, D.C.

The photo shows Bonnie Bethea (Mrs.) of the Navy

Cost Reduction Office spellbinding her pupils with the absorbing details of efficiency techniques.

In addition to cost reduction, the week-long course provides formal training in areas such as planning, development, programing, budgeting, and production to meet personnel and material requirements of the operating forces.





SHAPING THE IDEA

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